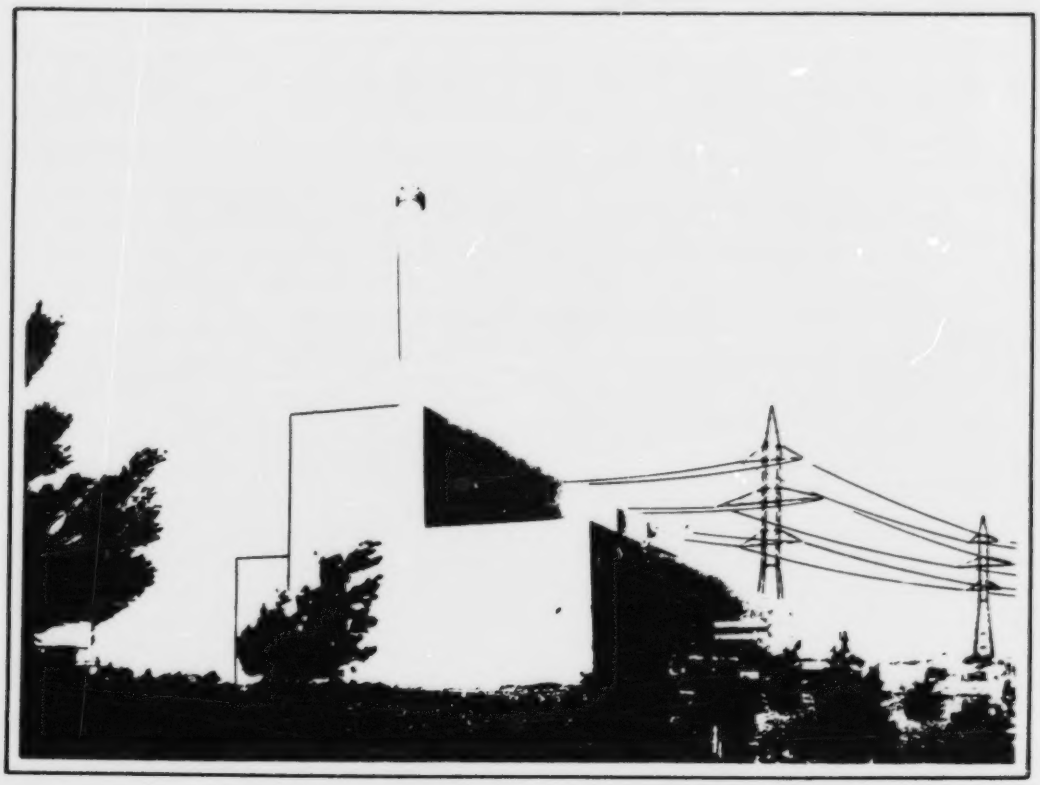
CANADIAN ELECTRIC UTILITIES

Analysis of Generation and Trends

1987



National Energy Board

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CANADIAN ELECTRIC UTILITIES

ANALYSIS OF
GENERATION AND TRENDS
1987

NATIONAL ENERGY BOARD
JUNE 1989

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DEFINITIONS* AND ABBREVIATION OF TERMS

Power: Power is the rate of delivery of energy and is measured in watts (W) (Electric energy is measured in watt hours).

Capacity: In the electric power industry, this word has two meanings:

1. Power, that is, the rate of delivery of energy. For example, a utility might sell 50 megawatts of capacity, i.e. of power.

2. The maximum quantity of power that some piece of equipment is capable of carrying. For example, a generating unit might have a rated capacity of 50 megawatts.

Energy: The capacity of doing work.

Electrical Energy: Energy in the form of electricity, normally expressed in units of watt hours or decimal multiples of watt hours.

Power:	"kW" - kilowatts	=	1 000 W
	"MW" - megawatts	=	1 000 kW
	"GW" - gigawatts	=	1 000 000 kW
	"TW" - terawatts	=	1 000 000 000 kW
Energy:	"kW.h" - kilowatt-hours	=	1 000 W.h
	"MW.h" - megawatt-hours	=	1 000 kW.h
	"GW.h" - gigawatt-hours	=	1 000 000 kW.h
	"TW.h" - terawatt-hours	=	1 000 000 000 kW.h

*Definitions are from "Electric Power: A compendium of terms" - Information Bulletin 8 - May 1985 - National Energy Board.

NOTE ON METRIC CONVERSION

The following table provides some conversion factors and metric equivalents, which are included to assist readers who may wish to convert information into Imperial Units.

Approximate Conversion Factor

S.I. Units		Imperial Units
1 cubic metre (m^3)	=	35.3 cubic feet
1 cubic metre (m^3)	=	6.3 barrels
1 litre (L)	=	0.22 gallon
1 kilogram (kg)	=	2.208 pounds
1 metric tonne	=	1.1023 short tons
1 gigajoule (GJ)	=	0.95 million British thermal units

Metric Equivalents

1 megagram	=	1 metric tonne
1 kilolitre	=	1 cubic metre

Introduction

This report is a continuation of a series of reports that have been published by the Board since 1971. Prior to that year, the information had been compiled for internal Board use. The report has been found to be of interest to those concerned with electric power matters in Canada. It is mailed to electric utilities, libraries, universities, agencies and other interested parties in Canada and the United States.

The report uses data submitted by the electric utilities to Statistics Canada. The Board received the final 1987 data from Statistics Canada in February 1989.

The report covers the net generation of electricity by Canadian electric utilities during the calendar year 1987 and gives totals for Canada with the breakdown by province, together with an analysis of fuel consumption fuel costs and thermal generating plant heat rates. Historical trends for the period 1983 to 1987 inclusive are described.

The analysis presented in Sections 1 to 4 of this report does not include the 37 548 GW.h (7.9 percent of the Canadian total) that were generated in 1987 by approximately 6 110 MW of installed capacity owned by industrial establishments. In Section 5, the industrial generation is shown on net generation and consumption graphs in order to present the complete picture.

Since the report deals with net station output to the electric utility systems, excluding station service, negative generation figures occur occasionally where a plant has used more electricity than it produced.

1. UTILITY GENERATION FOR CANADA

The total Canadian utility installed capacity at the end of 1987 was 94 348 MW; the corresponding energy generation was 438 961 GW.h. Table 1.A shows the distribution of the installed capacity and energy production by primary energy source.

TABLE 1.A

CANADIAN UTILITY GENERATION BY PRIMARY ENERGY SOURCE

FUEL TYPE	CAPACITY		ENERGY	
	(%)	(MW)	(%)	(GW.h)
FOSSIL	31.3	29 518.4	20.0	87 641.1
HYDRO	55.4	52 276.2	63.4	278 437.3
URANIUM	13.3	12 553.0	16.6	72 882.5
TOTAL	100.0	94 347.6	100.0	438 960.9

The installed capacity in each province at the end of 1987 and the energy generation in each province in 1987 are summarized in Table 1.B below. Detailed information is given in the Appendix. Each province's total net generation includes electric production for in-province use, and may include sales to other provinces and exports to the United States.

TABLE 1.B

INSTALLED CAPACITY AND GENERATION BY PROVINCE AND TERRITORY

PROVINCE/TERRITORY	CAPACITY		ENERGY	
	(%)	(MW)	(%)	(GW.h)
NEWFOUNDLAND*	8.0	7 571.4	8.8	38 778.9
PRINCE EDWARD ISLAND	0.1	122.5	0.0**	58.0
NOVA SCOTIA	2.4	2 288.7	1.7	7 371.3
NEW BRUNSWICK	3.5	3 288.9	2.7	11 809.8
QUÉBEC	26.1	24 642.5	31.2	137 149.9
ONTARIO	33.5	31 565.8	28.9	126 682.3
MANITOBA	4.4	4 116.8	4.5	19 851.0
SASKATCHEWAN	3.0	2 765.9	2.8	12 090.5
ALBERTA	7.6	7 207.8	7.7	33 659.8
BRITISH COLUMBIA	11.1	10 467.8	11.5	50 628.8
YUKON	0.1	120.6	0.1	426.8
NORTHEWEST TERRITORIES	0.2	189.0	0.1	443.8
TOTAL	100.0	94 347.7	100.0	438 960.9

* Includes Churchill Falls GS.

** Less than 0.1 percent

Table 1.C shows the distribution of the total Canadian utility fossil-fuel fired generating capacity and the energy production in 1987. Although, on a national basis, coal-fired generating facilities are the most important sources of fossil fuel generated electricity in Canada, it should be noted that this is not true in all regions. Many communities in isolated regions rely heavily on fuel oil for their electricity supply. Other regions are heavily reliant on non-fossil fuel sources such as nuclear or hydro. Specific details are provided in Tables 1.4 to 1.6 of the Appendix.

Statistics for multifuelled plants are not segregated in the appendix. Those plants are classified by the main fuel used for electricity generation.

TABLE 1.C

CANADIAN UTILITY GENERATION BY TYPE OF FOSSIL FUELLED GENERATION UNITS

UNIT TYPE	CAPACITY		ENERGY	
	(%)	(MW)	(%)	(GW.h)
STEAM: OIL	19.4	5 733.9	7.8	6 820.8
COAL	64.2	18 964.6	89.9	78 724.9
GAS	8.2	2 406.5	0.8	732.5
GAS TURBINE*	6.3	1 849.1	0.7	626.4
INTERNAL COMBUSTION*	1.9	564.4	0.8	736.5
TOTAL	100.0	29 518.5	100.0	87 641.1

* These unit types may use light fuel oil, diesel fuel or natural gas.

Various types of coal and oil are used for power generation. Table 1.D shows that a significant proportion of the energy generated from coal was produced with imported bituminous coal. Of the total coal used to generate electricity in Canada, subbituminus coal provided the largest portion, virtually all of it used in Alberta. Most of the energy generated from oil was from heavy fuel (residual) oil. Tables 1.7 and 1.8 of the Appendix provide additional information on coal- and oil-fired facilities.

TABLE 1.D

CANADIAN UTILITY GENERATION BY TYPE OF COAL AND OIL

TYPE OF COAL	COAL-FIRED (%)	COAL-FIRED (GW.h)	TYPE OF OIL	OIL-FIRED (%)	OIL-FIRED (GW.h)
BITUMINOUS	17.8	14 090.5	HEAVY	90.0	7 008.0
SUBBITUMINOUS	38.7	30 226.5	LIGHT	3.4	266.0
LIGNITE	14.8	11 606.9	DIESEL	6.6	512.3
CANADIAN COAL SUBTOTAL	71.3	55 923.9			
IMPORTED BITUMINOUS	28.7	22 457.1			
TOTAL	100.0	78 381.0	TOTAL	100.0	7 788.3

2. UTILITY GENERATION BY PROVINCE AND TERRITORY

Electrical utility generation by primary energy source for each province and territory is summarized below, in Table 2.A. More detailed 1987 data including utility reported fuel costs, are shown in Tables 2.1 to 2.12 of the Appendix.

In the provinces of Québec, Manitoba, and British Columbia, and in the Yukon Territory, hydro generation supplied in excess of 90 percent of electricity requirements. While Newfoundland was statistically also in this category, most of the province's hydro electricity was sold to Québec. Hydro generation also accounted for a significant portion of the energy supply in Ontario and the Northwest Territories. In Ontario one half of the energy generated was produced in nuclear power plants whereas in New Brunswick approximately 43 percent of its electricity was produced in its nuclear power plant. Most of the balance of the electricity generated in Canada was produced from fossil fuels.

TABLE 2.A

GENERATION BY PRIMARY ENERGY SOURCE
BY PROVINCE AND TERRITORY
PERCENT OF TOTAL

FUEL TYPE	NFLD	PEI	NS	NB	QUE	ONT
COAL - BITUMINOUS	---	---	71.9	11.0	---	23.1
- SUBBITUMINOUS	---	---	---	---	---	---
- LIGNITE	---	---	---	---	---	1.8
OIL - HEAVY	5.8	88.2	18.1	28.0	0.0*	0.0*
- LIGHT	0.1	---	0.1	0.1	0.0*	0.1
- DIESEL	0.3	11.8	0.1	0.0*	0.1	0.0*
NATURAL GAS	---	---	---	---	---	0.0*
URANIUM	---	---	---	43.2	3.4	49.8
HYDRO	93.8	---	9.8	17.7	96.5	25.1
TOTAL (%)	100.0	100.0	100.0	100.0	100.0	100.0
TOTAL (GW.h)	38 788.9	58.0	7 371.3	11 809.7	137 149.9	126 682.3

FUEL TYPE	MAN	SASK	ALTA	BC	YUK	NWT
COAL - BITUMINOUS	---	---	2.0	---	---	---
- SUBBITUMINOUS	---	---	89.8	---	---	---
- LIGNITE	2.6	72.7	---	---	---	---
OIL - HEAVY	---	---	---	---	---	3.5
- LIGHT	---	0.1	---	---	---	---
- DIESEL	0.1	0.1	0.0*	0.2	5.5	36.1
NATURAL GAS	---	0.9	3.9	0.1	---	---
URANIUM	---	---	---	---	---	---
HYDRO	97.3	26.4	4.3	99.7	94.5	60.4
TOTAL (%)	100.0	100.0	100.0	100.0	100.0	100.0
TOTAL (GW.h)	19 851.0	12 090.5	33 659.8	50 628.9	426.8	443.8

*Less than 0.1 percent.

3. FUEL CONSUMPTION FOR ELECTRICITY GENERATION BY PROVINCE

Fuels used in 1987 for thermal generation by Canadian electric utilities were coal (bituminous, subbituminous and lignite), oil (light, heavy and diesel), natural gas and uranium. Consumption of these fuels is described in the following sections.

3.1 Coal

3.1.1 Bituminous Coal

Of the total 13.6 million tonnes of bituminous coal consumed to generate electricity in Canada in 1987 (Table 3A), 10.4 million tonnes were used in Ontario. Of this, approximately 76 percent was imported from the United States. With the exception of the use of waste metallurgical coal in Alberta, Canadian bituminous coal use was restricted to the provinces of Ontario, Nova Scotia and New Brunswick. The 1987 average cost per tonne of bituminous coal was $69.95 or 26.1 mills ($0.0261) per kilowatt hour. The decrease in the average cost per tonne of bituminous coal in 1987 from 1986 was 1.6 percent, while the related cost per kilowatt hour dropped by 3.0 percent. Details on provincial consumption and cost are provided in Table 3.1 of the Appendix.

TABLE 3.A

BITUMINOUS COAL COSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	MILLIONS OF TONNES
NOVA SCOTIA	15.2	2.08
NEW BRUNSWICK	3.8	0.53
ONTARIO	76.5	10.407*
ALBERTA	4.5	0.61
TOTAL	100.0	13.62

* 7.864 MILLION TONNES WERE IMPORTED

3.1.2 Subbituminous Coal

Subbituminous coal consumption by electric utilities in 1987 was mainly restricted to Alberta (Table 3.B). Most of Alberta's major generating plants are located close to utility-owned coal mines. As well, the coal is relatively inexpensive to extract. This is why the 1986 average cost of coal to the utilities was only $8.39 per tonne or 5.13 mills per kilowatt hour. The increase in the average cost per tonne of subbituminous coal in 1987 from 1986 was 23.2 percent and 23.6 increase in the cost per kilowatt hour. The cost of coal in the previous year was depressed due to the lack of export contracts and low demand for coal. Additional details are provided in Table 3.2 of the Appendix.

TABLE 3.B

SUBBITUMINOUS COAL COSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	MILLIONS OF TONNES
ALBERTA	100.0	18.47
TOTAL	100.0	18.47

3.1.3 Lignite

In 1987, 79 percent of the lignite coal used for generation in Canada was consumed in Saskatchewan (table 3.C). Ontario and Manitoba used a relatively small amount. The 1987 average cost per tonne was $15.94 or 13.34 mills per kilowatt hour. The decrease in 1987 from 1986 in the average cost per tonne of lignite and cost per kilowatt hour was 1.3 percent and 3.6 percent respectively. Additional details are provided in Table 3.3 of the Appendix.

TABLE 3.C

LIGNITE COAL COSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	MILLIONS OF TONNES
ONTARIO	16.3	1.58
MANITOBA	4.7	0.46
SASKATCHEWAN	79.0	7.67
TOTAL	100.0	9.72

3.2 Oil

3.2.1 Light Oil

The consumption of light oil by Canadian utilities, by province, is shown in Table 3.D. Light oil is primarily used in combustion turbines and as a secondary fuel in coal and heavy fuel oil fired plants. The average cost of light oil in 1987 was $208.14 per kilolitre or 71.03 mills per kilowatt hour. The high mill rate cost reflects the use of light oil in ignition, warm-up and short duty applications. The decrease in 1987 from 1986 in the average cost per kilolitre of light oil and the cost per kilowatt hour was 19.4 percent and 14.8 percent respectively reflecting a general decrease in the world price for oil. Table 3.4 of the Appendix provides additional information on provincial consumption and cost.

TABLE 3.D

LIGHT OIL COSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	THOUSANDS OF KILOLITRES
NEWFOUNDLAND	23.7	21.5
NOVA SCOTIA	4.0	3.6
NEW BRUNSWICK	4.5	4.1
QUÉBEC	24.4	22.1
ONTARIO	40.5	36.7
MANITOBA	0.3	0.3
SASKATCHEWAN	2.6	2.4
TOTAL	100.0	90.7

3.2.2 Heavy Oil

The provincial consumption of heavy fuel oil by electric utilities in 1987 is shown in Table 3.E. New Brunswick continues to be the largest user of heavy fuel oil for electricity generation, consuming approximately half the total. In 1987, the average cost of heavy fuel oil to utilities was $130.02 per kilolitre or 33.7 mills per kilowatt hour. The decrease in 1987 from 1986 in the average cost per kilolitre of heavy fuel and the cost per kilowatt hour was 8.7 percent and 11.6 percent respectively. This decrease was again mainly due to the decrease in the world oil price. More detailed heavy oil consumption data are also presented in Table 3.5 of the Appendix.

TABLE 3.E

HEAVY OIL COSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	THOUSANDS OF KILOLITRES
NEWFOUNDLAND	31.6	573.6
PRINCE EDWARD ISLAND	1.3	23.6
NOVA SCOTIA	18.9	342.4
NEW BRUNSWICK	46.2	838.2
QUÉBEC	1.5	27.1
ONTARIO	0.3	7.0
NORTHWEST TERRITORIES	0.2	4.2
TOTAL	100.0	1 816.1

3.2.3 Diesel Oil

All the provinces and territories reported consumption of diesel oil in 1987 (Table 3.F). Diesel is mainly used to fuel internal combustion generating plants in isolated regions. The largest consumers were therefore provinces with a substantial number of isolated communities, Newfoundland, Québec, Manitoba, British Columbia, Yukon and the Northwest Territories. These accounted for approximately 90 percent of the total consumption. The average cost to utilities for diesel fuel in 1987 was $325.15 per kilolitre or 108.8 mills per kilowatt hour. The decrease in 1987 from 1986 in the average cost per kilolitre of diesel oil and the cost per kilwatt hour was 9.2 percent and 7.5 percent respectively. This decrease was due to the fall in the world oil price. Additional details are presented in Table 3.6 in the Appendix.

TABLE 3.F

DIESEL OIL COSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	THOUSANDS OF KILOLITRES
NEWFOUNDLAND	19.5	33.4
PRINCE EDWARD ISLAND	2.0	3.5
NOVA SCOTIA	2.3	3.9
NEW BRUNSWICK	1.1	1.9
QUÉBEC	15.0	25.7
ONTARIO	0.1	0.1
MANITOBA	5.4	9.4
SASKATCHEWAN	1.5	2.5
ALBERTA	2.4	4.1
BRITISH COLUMBIA	15.6	26.8
YUKON	4.0	6.9
NORTHWEST TERRITORIES	31.1	53.3
TOTAL	100.0	171.5

3.3 Natural Gas

Table 3.G below shows the percentage distribution of natural gas consumption by province. In 1987 Alberta accounted for approximately 88 percent of the total. The 1987 average cost of natural gas to utilities was $65.00 per thousand cubic metres, or 23.6 mills per kilowatt hour. The decrease in 1987 from 1986 in the average cost of natural gas and the cost per kilowatt hour was 11.0 percent and 18.3 percent respectively. This decrease in cost is attributable to a relatively abundant short-term supply and a decrease in the world price of oil, the competing alternative fuel. Details are provided in Table 3.7 of the Appendix.

TABLE 3.G

NATURAL GAS COSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	MILLIONS OF CUBIC METRES
ONTARIO	0.3	1.3
MANITOBA	0.2	0.9
SASKATCHEWAN	8.2	44.0
ALBERTA	87.8	470.6
BRITISH COLUMBIA	3.5	19.0
TOTAL	100.0	535.8

3.4 Uranium

Table 3.H summarizes the use, by province, of uranium for the generation of electricity in 1987. In Canada, only three provinces, Ontario, New Brunswick and Quebec have nuclear power reactors for generating electricity. The average cost of uranium fuel in Canada was $278.74 per kilogram of uranium, or 4.97 mills per kilowatt hour. The increase in 1987 from 1986 in the average cost of uranium fuel was 1.1 percent. However, the cost per kilowatt hour decreased 1.2 percent in 1987 from 1986. Additional details are provided in Table 3.8 of the Appendix.

TABLE 3.H

URANIUM COSUMPTION FOR ELECTRICITY GENERATION

PROVINCE	% OF TOTAL	THOUSANDS OF KILOGRAMS
NEW BRUNSWICK	7.6	99.2
QUÉBEC	6.7	87.1
ONTARIO	85.7	1 113.5
TOTAL	100	1 299.8

4. ACTUAL NET STATION HEAT RATES

The efficiency of thermal generating stations can be expressed in terms of their respective heat rates in kJ/kW.h. In this report net station heat rates are obtained by dividing the gross kilojoule energy input to a station by its net electrical energy generation (net station generation is equal to the gross station generation less the station service load). For presentation purposes, the actual net station heat rates are plotted against unit size based on the nameplate rating of the largest unit in the respective plant. These unit size heat rates are represented by the curves presented in Figure 4.1, 4.2, and 4.3 for the various types of generating stations. The data used reflect actual net station heat rates in 1987 obtained under actual operating conditions and are not to be confused with design heat rate curves for various types and sizes of thermal units. Because of insufficient data, no curves are shown for nuclear or gas-fired generating stations.

4.1 Steam Electric Plants

Figure 4.1 shows the 1987 net station heat rates associated with coal and oil-fired steam electric generating stations in Canada. Coal-fired units ranged in size between 15 and 500 MW; oil-fired units ranged between 20 and 573 MW.

4.2 Gas Turbines

The 1987 net heat rates for gas turbines versus unit size are illustrated in Figure 4.2. Because gas turbines of similar sizes may have widely varying heat rates depending on the mode of operation of the units, and the ambiant air temperature, a single-valued function is not appropriate. Therefore, a range is shown for each unit size. The majority of data points fell between or on the upper and lower curves. As Figure 4.2 shows, the variation in unit size is from 7 to 68 MW. Gas turbines ranged in size between 2.5 and 68 MW.

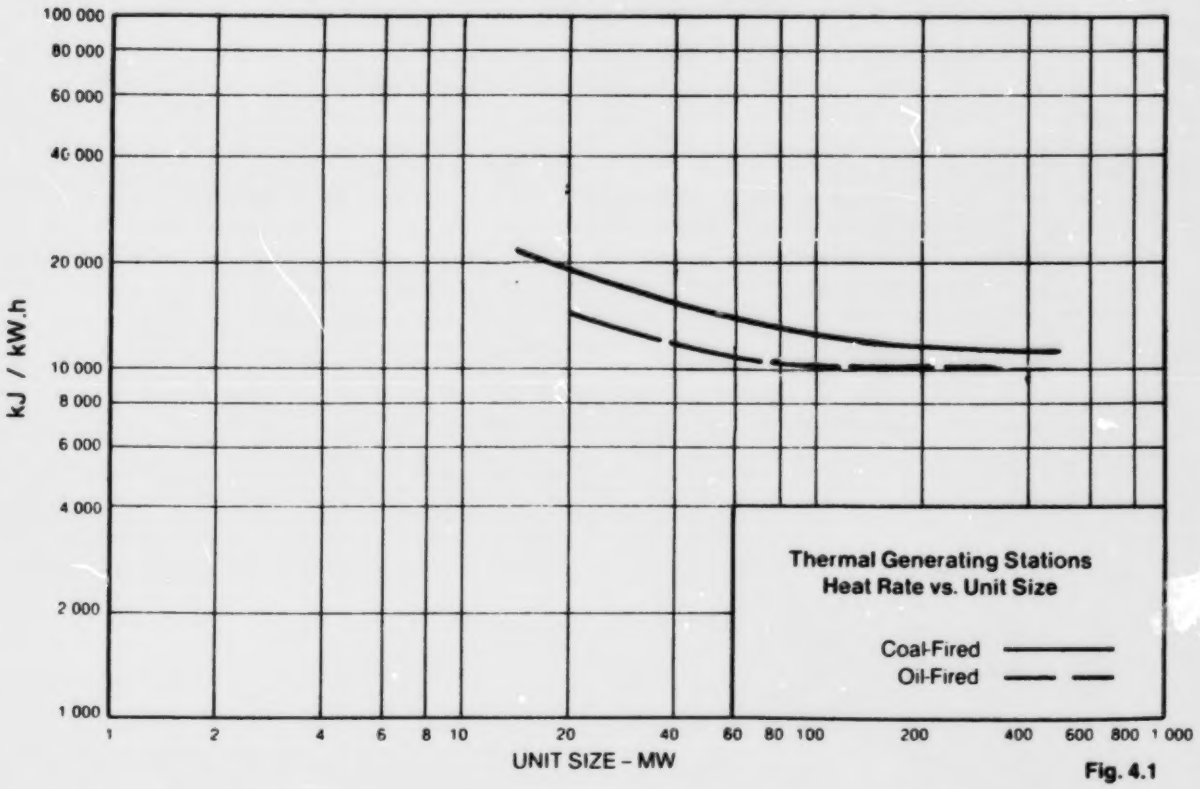
100 000
80 000
60 000
40 000
20 000
10 000
8 000
6 000
4 000
2 000
1 000
kJ / kW.h
1
2
4
6
8
10
20
40
60
80
100
200
400
600
800
1 000
UNIT SIZE - MW
Thermal Generating Stations
Heat Rate vs. Unit Size
Coal-Fired
Oil-Fired

Fig. 4.1

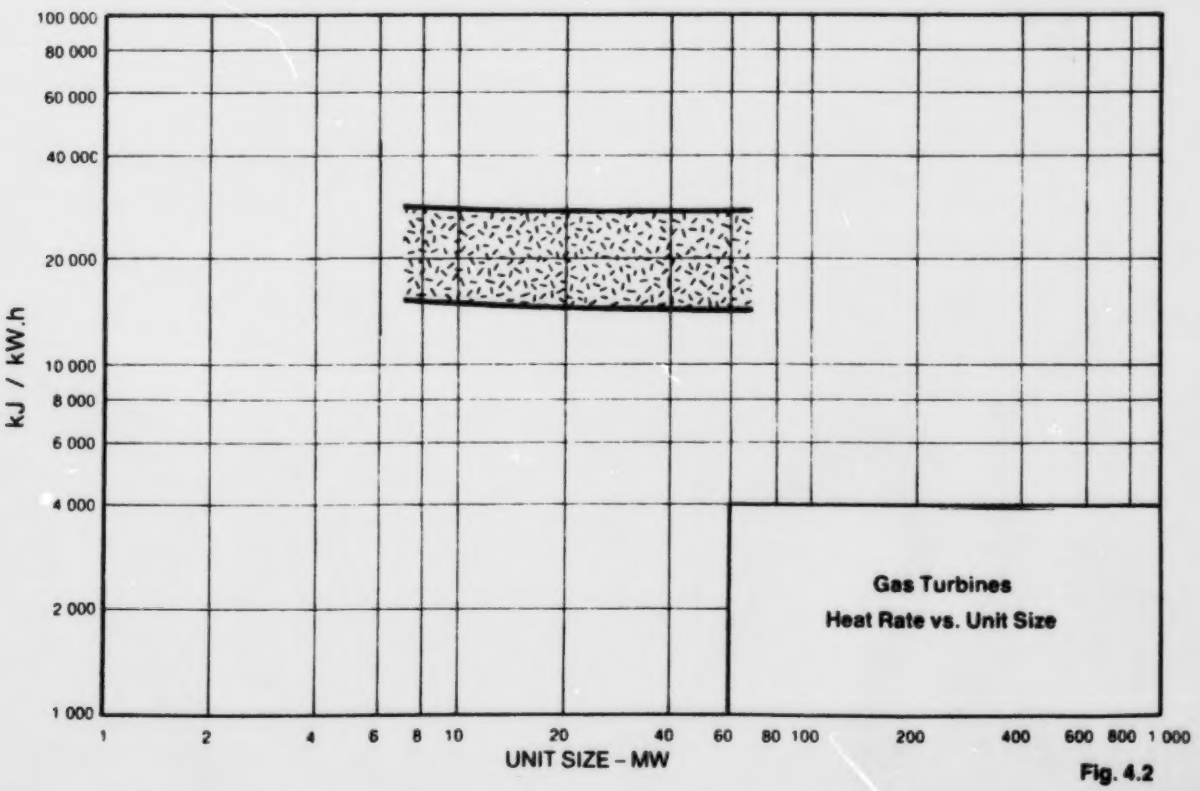
100 000
80 000
60 000
40 000
20 000
10 000
8 000
6 000
4 000
2 000
1 000
kJ / kW.h
1
2
4
6
8
10
20
40
60
80
100
200
400
600
800
1 000
UNIT SIZE - MW
Gas Turbines
Heat Rate vs. Unit Size

Fig. 4.2

4.3 Internal Combustion Units

Analysis of data for internal combustion units of similar sizes shows a variation of heat rates. The lower heat rates reflect units used more or less continuously while the higher values are representative of units used principally for standby operation. Internal combustion unit size versus heat rate relationships can be more approporiately expressed by a curve having an upper and lower bound rather than by a single line. The curve is displayed in Figure 4.3 where most of the data points fell between or on the upper and lower curves. The figure is based on unit sizes ranging from 10 to 6 800 kW. For the units larger than 2 000 kW, heat rates range from 10 000 kJ/kW.h to 20 000 kJ/kW.h.

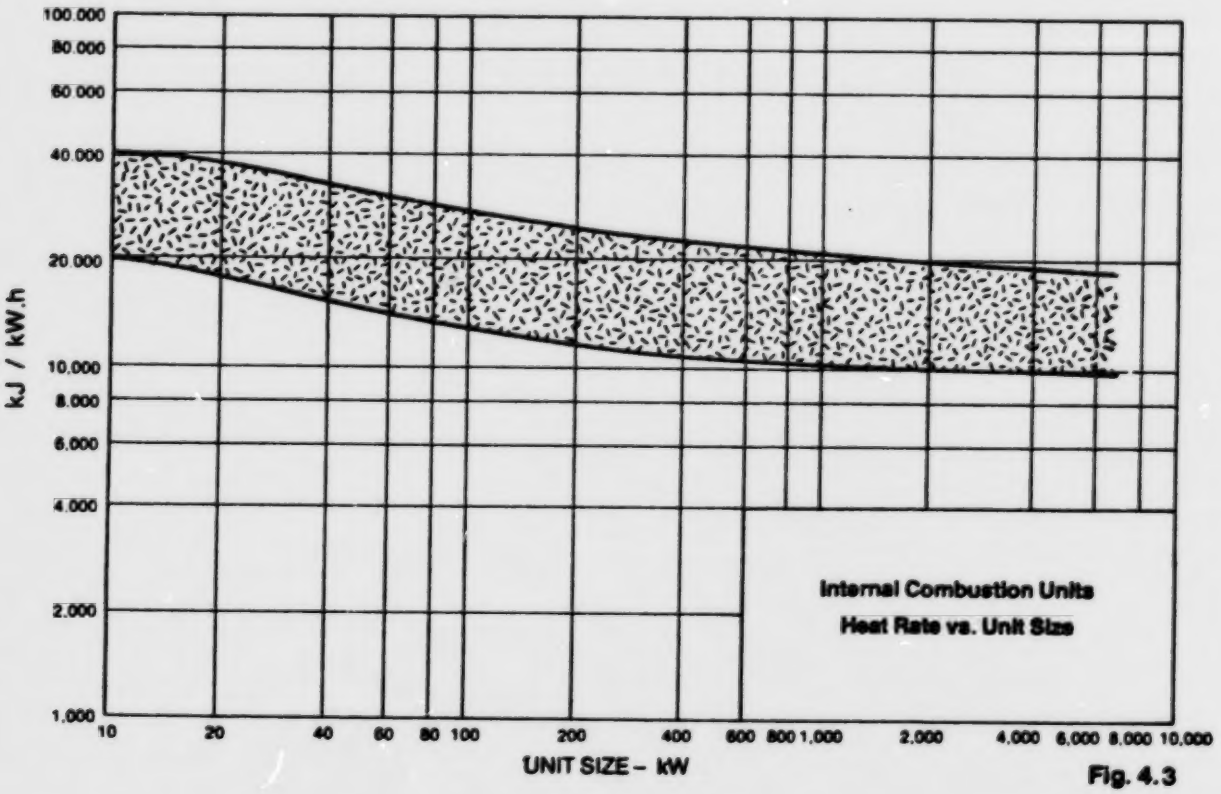

Fig. 4.3

5. CANADIAN AND PROVINCIAL TREND ANALYSIS 1983-1987

The previous sections deal with generation, fuel consumption and cost data for Canadian electrical utilities in the year 1987. This section reviews Canadian and provincial trends (including the Yukon and Northwest Territories) over the historical period, 1983 to 1987. The data are based on previous reports in this series except for the data on industrial self-generation and total provincial consumption, which are based on Statistics Canada publications. The provincial consumption includes the total provincial generation plus purchases minus exports and inter-provincial sales. The difference between consumption and total generation is shown as a net inflow or net outflow.

5.1 Canada

Figure 5.1(A) shows the total energy generation and consumption figures for Canada during the period from 1983 to 1987 inclusive. The total generation increased at a compound annual rate of 4.8 percent from 1983 to 1987 and increased 4.3 percent from 1986 to 1987. The total consumption increased 3.3 percent per annum in the five years leading up to 1987 and increased 4.0 percent in 1987. The gross exports of 47.4 TW.h in 1987 were up 21.9 percent from the level in 1986. This sudden increase of export sales was largely attributable to a combination of unusual weather conditions in Canada and the United States.(1)

Figure 5.1 (B) illustrates the share of total generation by primary energy source. The nuclear and hydro combined share of total generation remained essentially unchanged in 1987 from 1986. However, due to low water levels in 1987, the hydro portion decreased by 4.8. Nuclear generation increased its share by 3.8 percent in 1987. The coal component of the total share increased by 11.9 percent to 17.9 percent of the total. The use of oil and gas continue to be insignificant.

Figure 5.1(C) shows the thermal energy generated by fuel type while Figure 5.1(D) shows the corresponding fuel cost (mills/kW.h) associated with each type over the review period. Also shown in Figure 5.1(D) is the average system fuel cost trend for Canada. The average system fuel cost was calculated by dividing the total electrical utilities' fuel costs for each year by the total generation including both thermal and hydro production. The average system fuel cost for each province is shown in the graphs in section 5.2 to 5.13 which follow. This trend gives an indication of the significance of the fuel cost component to the total system generation costs. From Figure 5.1(D) it can be seen that the average system fuel cost, which was 4.58 mills/kW.h during 1983, has decreased to 4.49 mills/kW.h in 1987. The increase from 1986 to 1987 was 1.2 percent. The five year decline is due to a drop in overall fossil fuel prices, especially oil, and the increasing use of hydro and nuclear generation.

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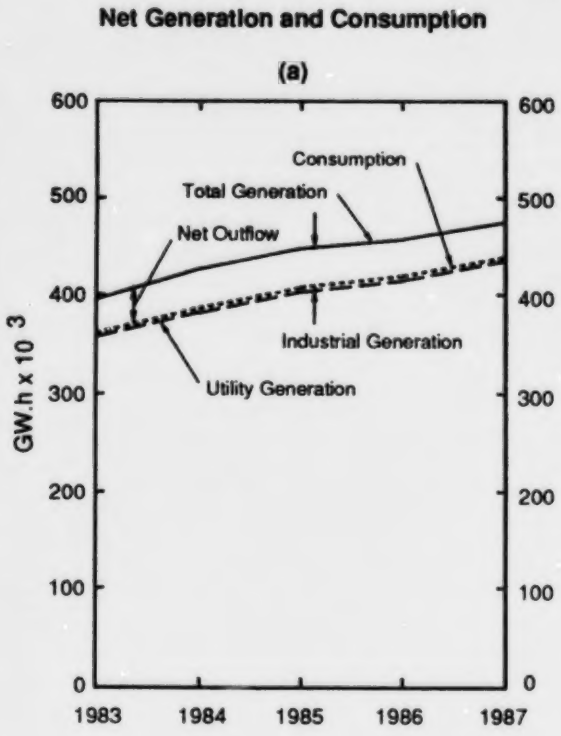
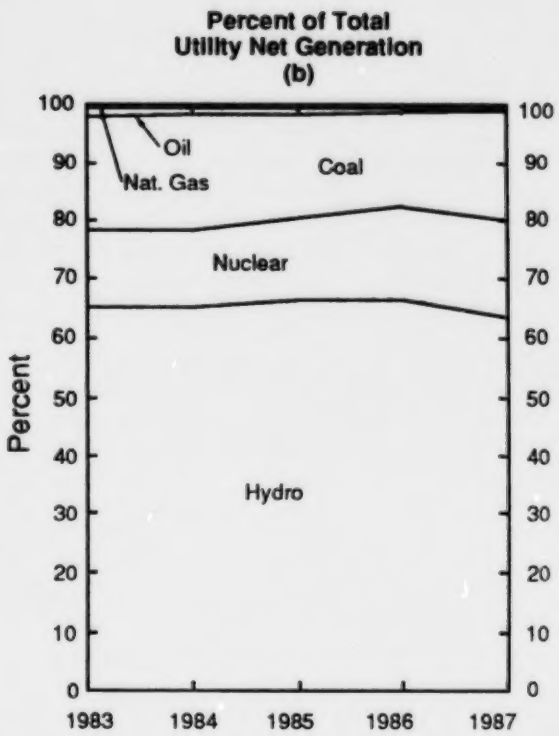
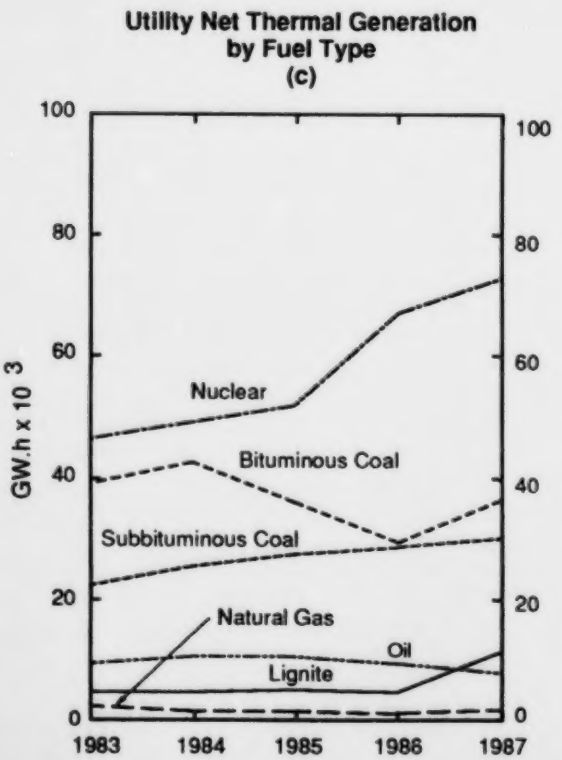
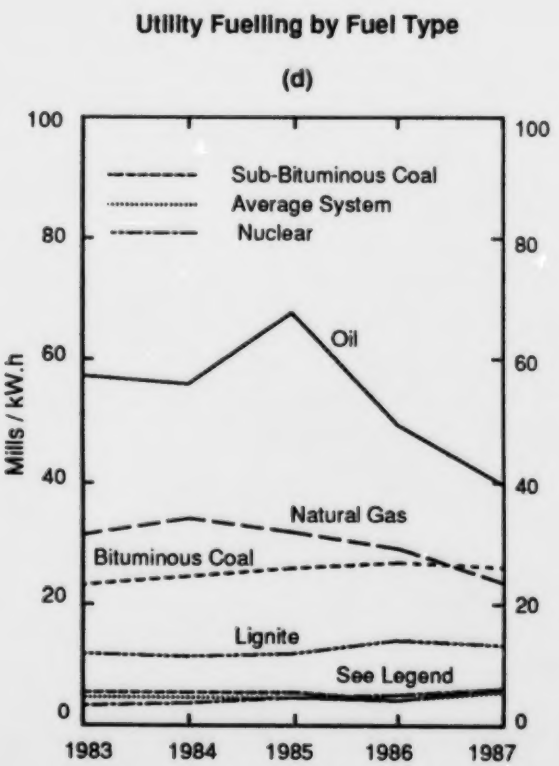
(1) In 1987, the exporting provinces of British Columbia and Quebec had better than average water conditions while the U.S. market suffered dryer than average conditions coupled with rapid load growth.

Fig. 5.1 Canada









It must be noted that the average system fuel cost for electric utilities in Canada includes a significant component of low cost nuclear generation priced at 5.0 mills/kW.h in 1987 and hydro generation which is assumed to be of zero fuel cost. Nuclear and hydro generation by electric utilities comprised approximately 83 percent of the total. The zero cost assumption for hydro does not take into account water usage charges or taxes which are levied in certain provinces.

5.2 Newfoundland

As shown in Figure 5.2(A), electric utilities' net generation for 1987 in Newfoundland, at 38 789 GW.h, was down from the 1986 level of 40 076 GW.h. This decrease is attributable to a decrease in the amount of energy sold to Québec from the Churchill Falls plant, from 30 695 GW.h in 1986 to 30 392 GW.h in 1987. This is shown as net outflow in Figure 5.2(A). Consumption within the province has increased steadily since 1983. The increase from 1983 to 1986 was 6.8 percent. The increase in 1987 from 1986 was 4.3 percent.

Excluding Labrador, hydro-electric generation accounted for 55 percent of Newfoundland's total electricity supply in 1987. The balance was supplied from oil-fired facilities. Newfoundland relies on oil-fired generation to make up the difference between total provincial demand and the variable supply available from hydro generation on the island. This variability, due to the limited hydro storage capacity available and annual changes in rainfall, explains the fluctuations in oil consumption illustrated in Figure 5.2(C).

Excluding the Churchill Falls generation in Labrador, the average system fuel cost increased to 16.4 mills/kW.h in 1987 from 16.2 mills/kW.h in 1986. The average system cost, excluding Churchill Falls, over the five year period to 1987 has varied depending on hydro availability and the burning of oil to generate electricity.

5.3 Prince Edward Island

All of Prince Edward Island's on-island generation is oil-fired. The Province's major utility, Maritime Electric, purchased a 20 MW participation in the New Brunswick Electric Power Commission's [NBEPC] Dalhousie # 2 coal-fired unit, and the Island consumption is now almost totally supplied by this arrangement and by purchases of energy from NBEPC, over an underwater cable interconnection. The Interconnection Agreement (signed in 1981) is for 30 years.

In 1987, the Island's electricity consumption was 649 GW.h, a 6.9 percent increase from the previous year. Of this 58 GW.h was generated on the Island. In 1986, the on-island generation was 12 GW.h. However, the higher on-Island demand in 1987 combined with reduced availability of electricity from New Brunswick and lower world oil prices, has led to an increase in the on-island generation . The average system cost for on-island generation in 1987 was 71.2 mills/KW.

Fig. 5.2 Newfoundland

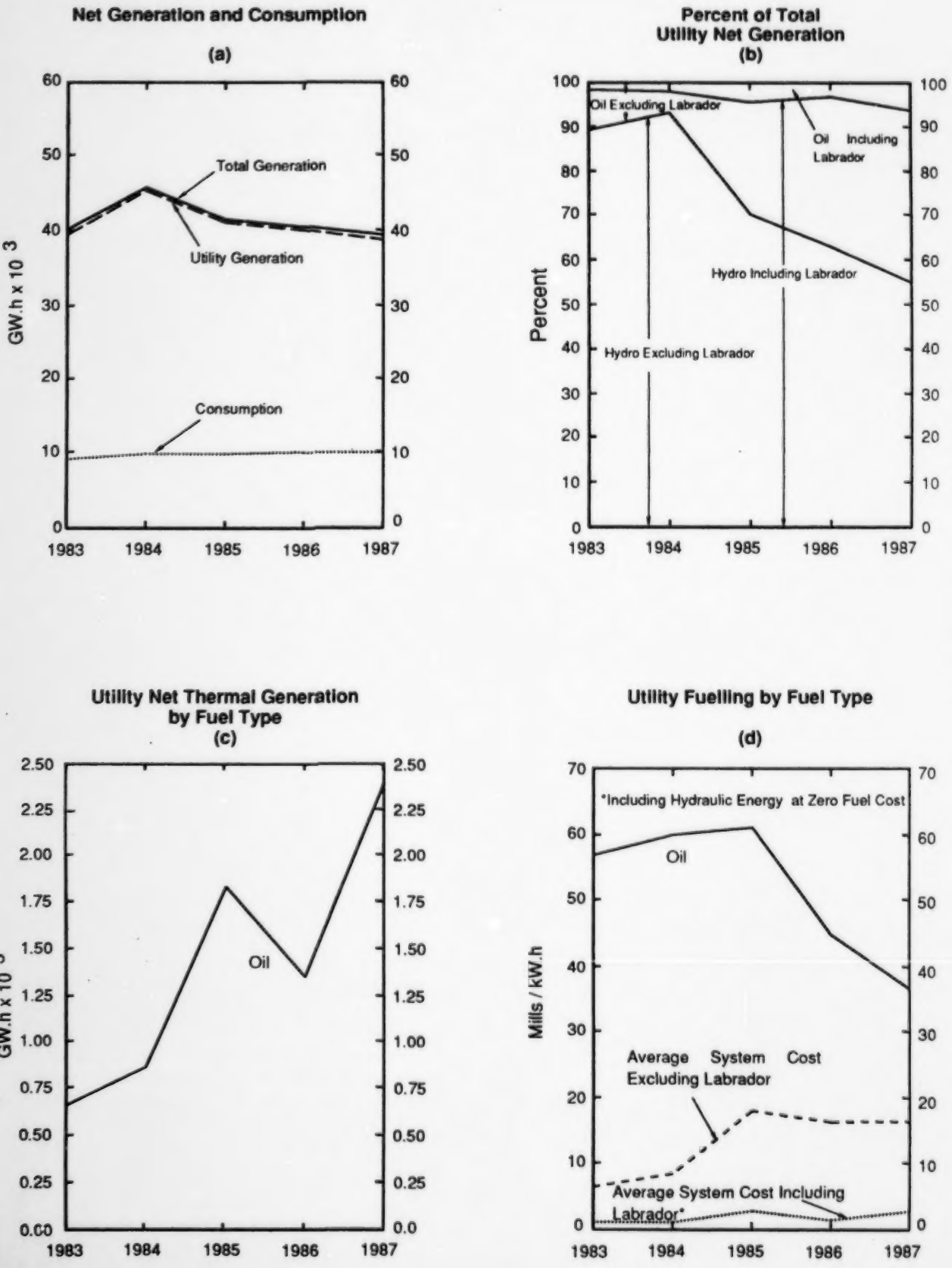
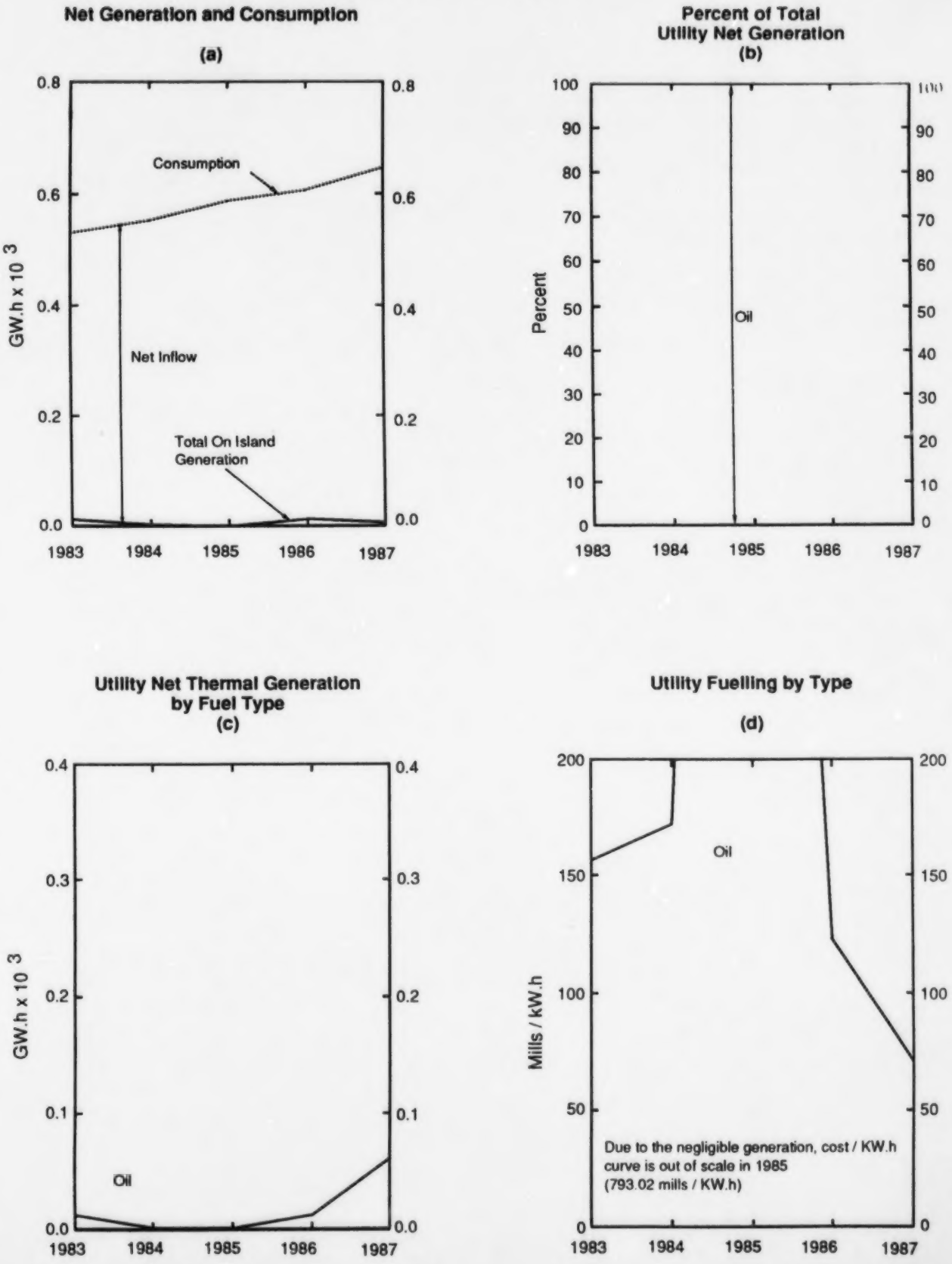


Fig. 5.3 Prince Edward Island



5.4 Nova Scotia

As shown in Figure 5.4(A), utility net generation increased approximately 4.5 percent from 1986 to 1987 to 7371 GW.h and purchases from New Brunswick made up the difference to meet total consumption. Figures 5.4(B) and 5.4(C) show that the province continues its use of indigenous coal resources to reduce its dependence on oil-fired generation. In 1987, 72 percent of total generation was produced using coal, compared to 56 percent in 1983. Due to low water levels in 1987, hydro production decreased 28 percent compared to 1986.

Total consumption increased from 6 781 Gw.h in 1983 to 8 328 Gw.h in 1987, an average annual rate of increase of 5.3 percent. The 1987 increase was 4.7 percent.

The average system fuel cost increased from 23.9 mills/kW.h in 1986 to 26.4 mills/kW.h in 1987.

5.5 New Brunswick

As shown in Figure 5.5(A), utility net generation increased from 11 450 GW.h in 1986 to 11 810 GW.h in 1987. In-province consumption increased 4.2 percent in 1987 to 12 040 GW.h. The balance of in-province consumption was met by purchases from Hydro Québec.

Figure 5.5(B) shows that approximately 39 percent of total utility net generation was coal and oil fired in 1987, compared to 27 percent in 1986. This increase is attributable to the reduced availability of hydro resources in 1987. The largest share of total in-province generation continues to be nuclear generation, which accounts for over 43 percent of the total.

Export sales in 1987 were 6 141 GW.h, down from 7 008 GW.h in 1986, while purchases from Hydro Québec were 6 913 GW.h. Interprovincial sales totaled approximately 1 272 GW.h in 1987. This is shown as a net outflow in Figure 5.5(A).

The average system fuel cost in 1987 was 13.8 mills/kW.h, up from the previous year of 10.4 mills/kW.h and 13.5 mills/kW.h in 1983. This increase is attributable to the increased use of fossil fuels, namely oil, to compensate for the low hydro availability as well as increased demand.

Fig. 5.4 Nova Scotia

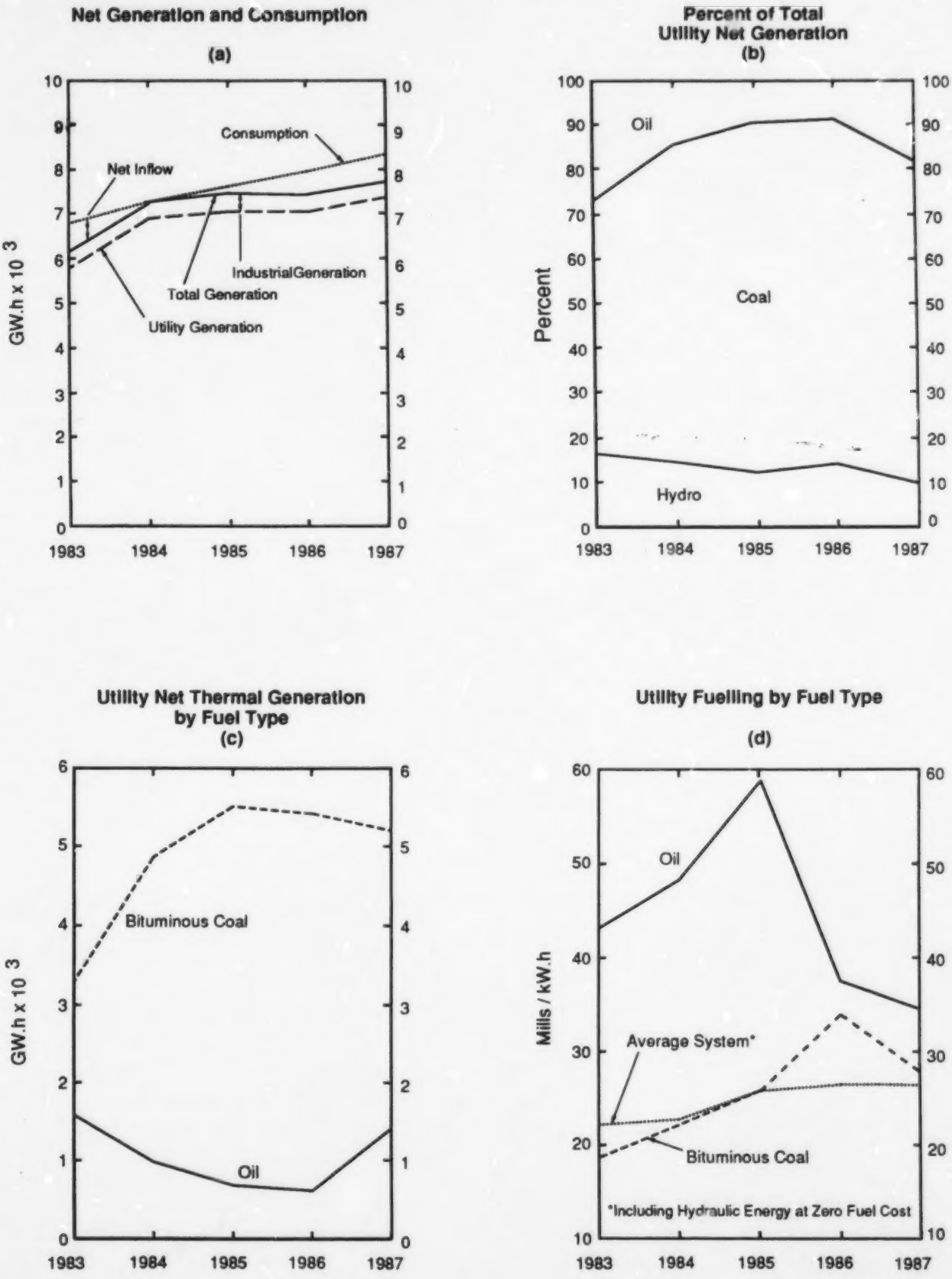
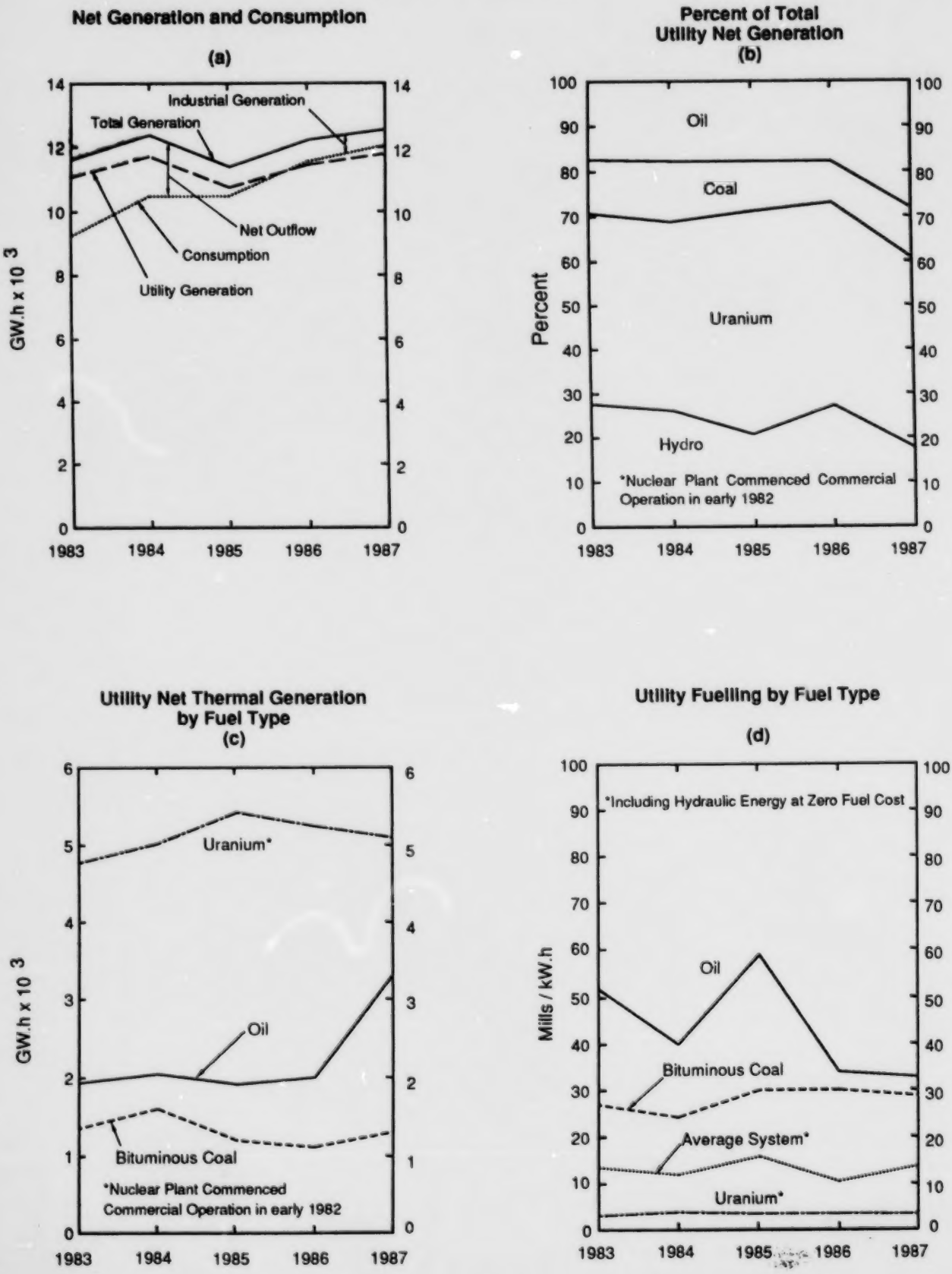


Fig. 5.5 New Brunswick



5.6 Québec

As shown in Figure 5.6 (A), utility net electricity generation in Québec increased by 4.4 percent in 1987 to 137 150 from 131 300 GW.h in 1986. Figures 5.6 (B) and 5.6 (C) illustrate that virtually all of the energy generated in the province is hydraulic. Oil is use primarily in peaking facilities and in isolated locations. Nuclear generation is also shown for the Gentilly II reactor, Québec's only operating nuclear power facility.

In 1987, in-province consumption increased to 159 160 GW.h from 152 600 GW.h in 1986, an increase of 4.3 percent. The average annual rate of growth in consumption since 1983 was 6.8 percent.

Figure 5.6 (A) also shows a net inflow of electricity from out of province. This is due to Hydro-Québec's purchase of 30 392 GW.h in 1987 from Churchill Falls in Labrador. Québec exported 16 401 GW.h of energy to the United States in 1987 compared to 12 674 GW.h in 1986. Québec sold a total of 13 939 GW.h to Ontario and New Brunswick in 1987.

The average system fuel cost of electricity generation, assuming a zero cost for hydro, was negligible.

5.7 Ontario

Figure 5.7 (A) shows that in 1987, utility net generation increased 3.0 percent to 126 700 GW.h in 1987 from 121 500 GW.h in 1986. Figure 5.7 (B) illustrates that in 1987, the nuclear share of total electrical energy generation has increased to approximately 50 perent, the largest single source of generation. The coal-fired generation share has increased to 25 percent of the total. Most of the economic hydro resources in Ontario have been developed. As a result, most major new facilities are either nuclear or coal-fired.

Total consumption of electricity increased by 4.3 percent to 132 500 GW.h in 1987 from 127 000 GW.h in 1986. Ontario exported 8 497 GW.h in 1987 up from 7 957 GW.h in 1986. Purchases from Québec and Manitoba totalled 7 940 GW.h in 1987 and imports from the United States were 2 113 GW.h, resulting in a net inflow as shown in Figure 5.7(A)

The average system fuel cost in 1987 was 9.2 mills/kW.h, up from 8.0 mills/kW.h in 1986 and 8.7 mills/kW.h in 1983. A significant contributor to this low cost was the nuclear fuel component at a cost of 5.3 mills/kW.h in 1987.

Fig. 5.6 Quebec

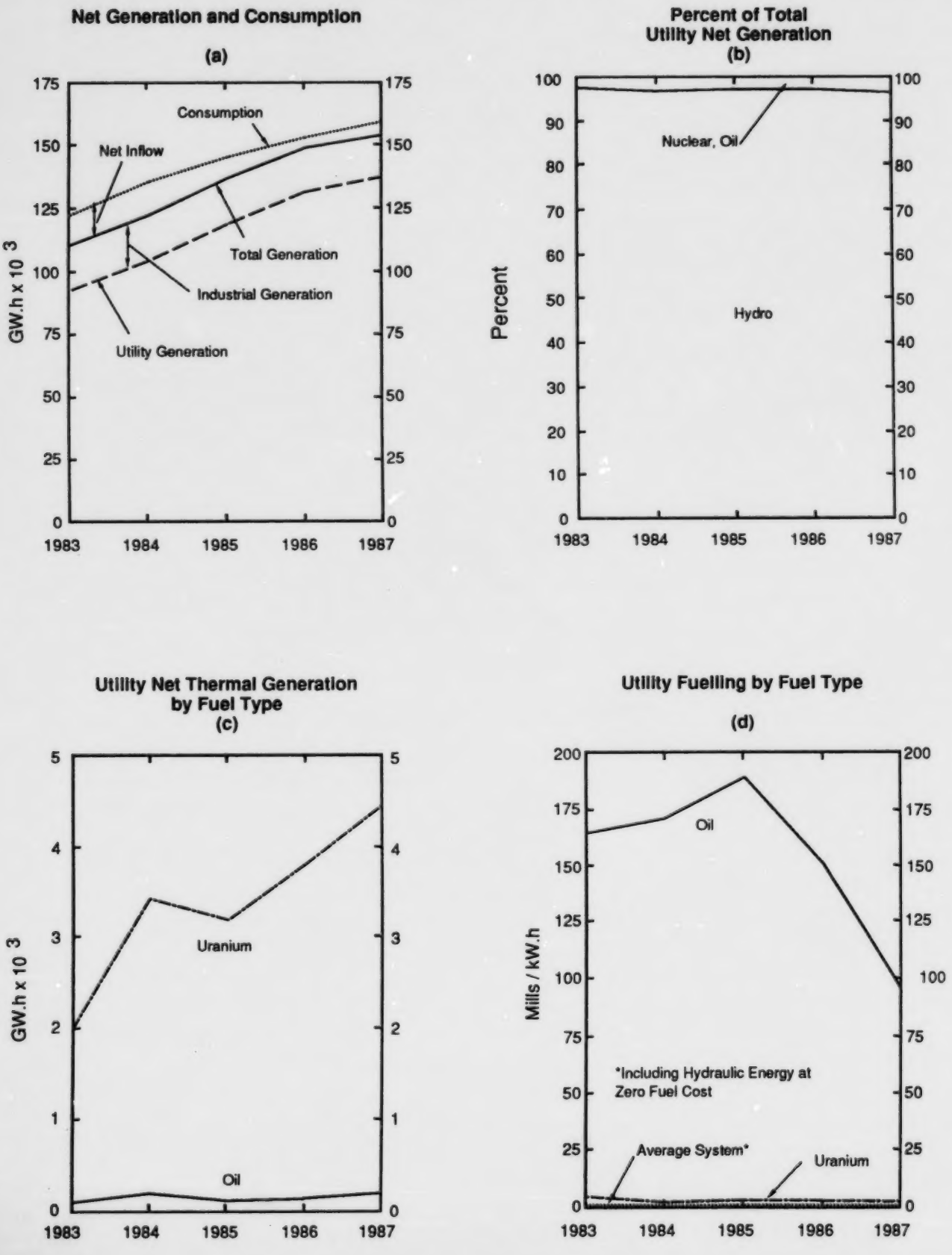
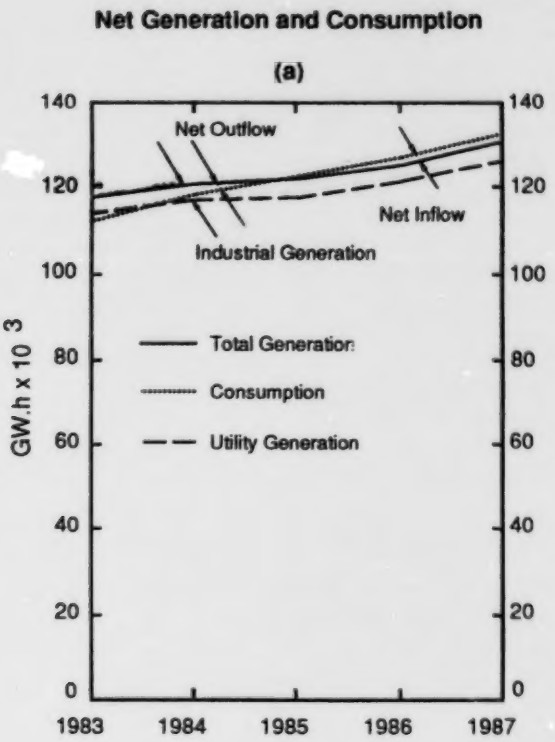
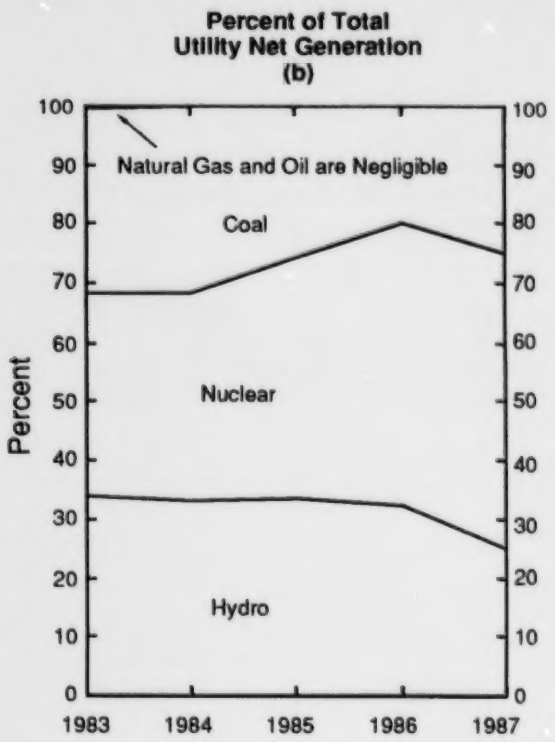
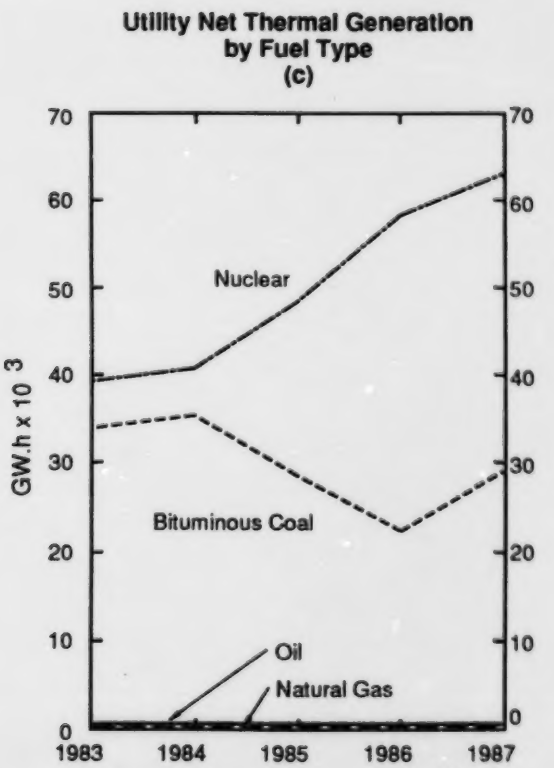
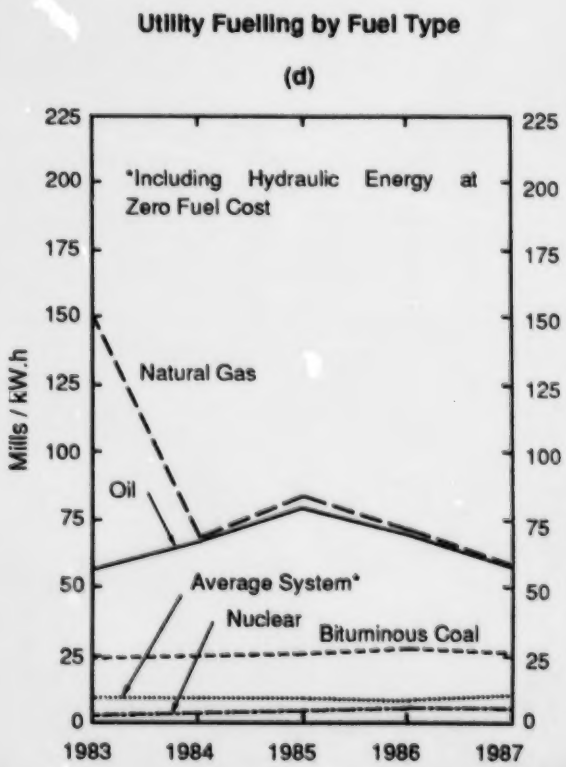


Fig. 5.7 Ontario









5.8 Manitoba

Figure 5.8 (A) shows that utility net generation decreased significantly in Manitoba to 19 850 GW.h in 1987 from 24 000 GW.h in 1986. Virtually all of the energy was produced from hydro resources. Figure 5.8 (B) shows that fossil fuels accounted for less than one percent of total generation.

Total in-province consumption decreased from 16 200 GW.h in 1986 to 15 860 in 1987, a decrease of 3.2 percent. Export sales decreased to 3 461 GW.h in 1987 from 6 489 GW.h in 1986, a decrease of 47 percent. Due to dry weather conditions, the large decrease in export sales and reduced in-province demand, utility net generation declined substantially in 1987.

The average system fuel cost was insignificant since hydro is included at zero cost and fossil fuels are hardly used.

5.9 Saskatchewan

As shown in Figure 5.9 (A), utility net generation increased to 12 100 GW.h in 1987 from 11 600 GW.h in 1986. Due to dry weather, water flows on the Saskatchewan River system decreased in 1987. These decreased flows increased the total requirement for coal-fired generation to 73 percent of total production in 1987 from 67 percent in 1986. Hydroelectric production in 1987 decreased to 26 percent of the total utility net generation from 33 percent of the total in 1986. Lignite and subitumious coal continued to be the major source of electricity in the province, accounting for 73 percent of the total, as shown in Figure 5.9 (B). Gross exports totalled 113 GW.h in 1987, but were offset by net energy purchases from Manitoba and some imports resulting in a net inflow.

In-province consumption increased 4.6 percent to 12 500 GW.h in 1987 from 11 950 GW.h in 1986. The five-year annual compound growth rate to 1987 was 3.7 percent.

In 1987, the average system fuel cost was 7.5 mills/kW.h, slightly up from 7.4 mills/kW.h in 1986. This low average cost was due to the heavy reliance on inexpensive sources of indigenous lignite. Oil was also used for electricity generation but the amount used was insignificant and is not shown in Figure 5.4 (D).

Fig. 5.8 Manitoba

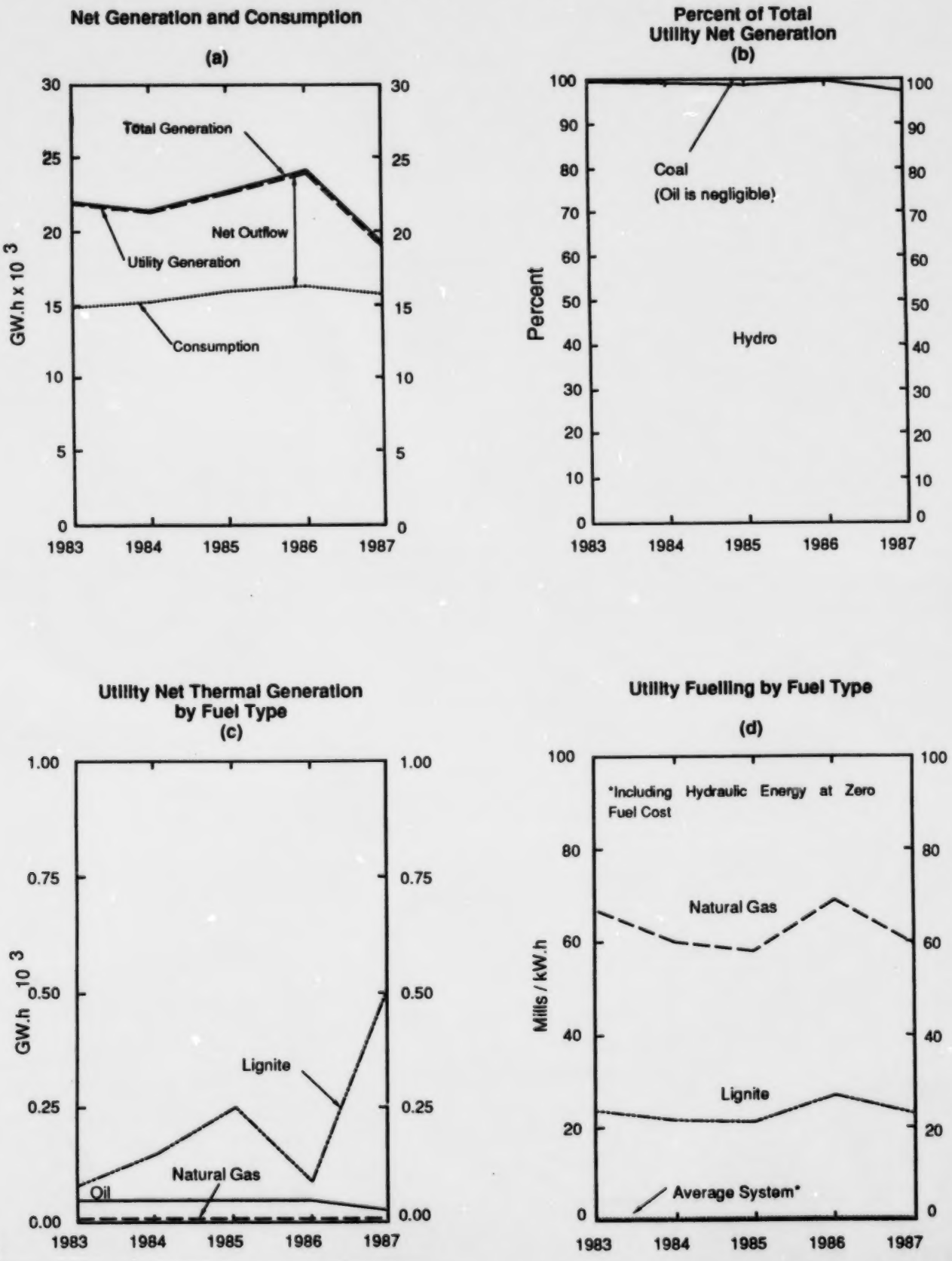
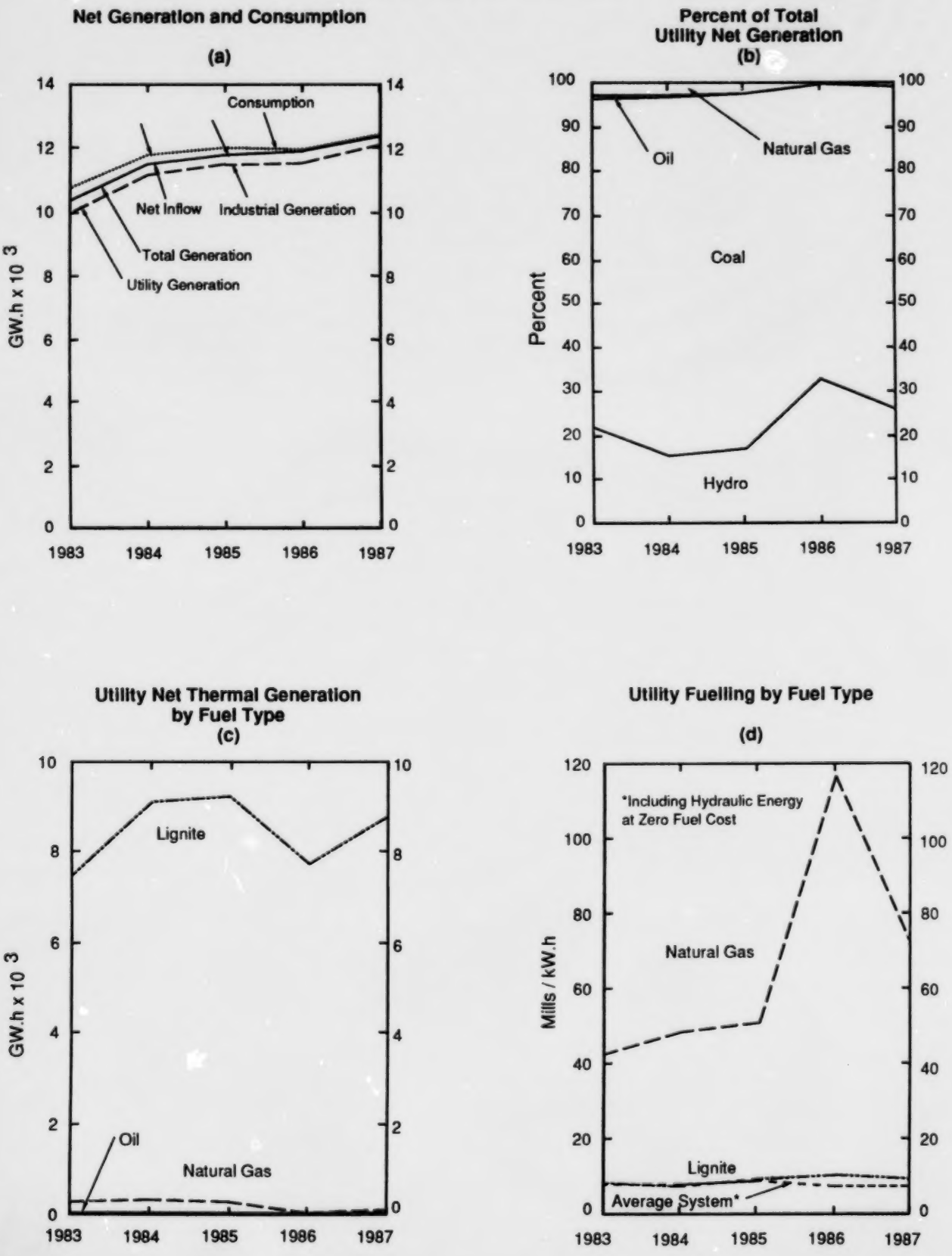


Fig. 5.9 Saskatchewan



5.10 Alberta

As shown in Figure 5.10 (A), electrical utilities' net generation increased to 33 660 GW.h in 1987 from 31 700 GW.h in 1986, an annual growth rate of 6.2 percent. Alberta increased its use of indigenous subbituminous coal to 92 percent of total generation in 1987.

During the five year period to 1987, in-province consumption rose at a compound rate of 5.7 percent to 36 500 GW.h. The 1987 increase was 4.9 percent.

The average system fuel cost in 1987 was 5.5 mills/kW.h, up from the previous year of 4.7 mills/kW.h. This low average system cost is primarily due to the extensive use of inexpensively extracted indigenous coal resources, and vertical integration in the coal mining and power generation industries. Since less than 0.1 percent of total generation in Alberta in 1987 was generated from oil, the oil fueling cost is not shown in Figure 5.10 (D). The average oil costs were over 80 mills/kW.h in 1987.

5.11 British Columbia

As shown in Figure 5.11 (A), electric utilities' net generation increased substantially to 50 600 GW.h in 1987 from 39 700 in 1986, an increase of 27.5 percent. This high level of hydro generation is due to an exceptional water year and resulted in a large increase in total exports from 4 156 GW.h in 1986 to 12 815 GW.h in 1987. As shown in Figure 5.11(B), 99.7 percent of total generation in 1987 was hydroelectric, virtually unchanged from the four previous years.

In-province consumption increased from 49 490 GW.h in 1986 to 51 400 GW.h in 1987, an increase of 3.9 percent. The five-year average annual compound rate to 1987 was 3.6 percent.

The average system fuel cost, illustrated in Figure 5.11 (D) was negligible given the zero cost attributed to hydro and the limited use of fossil fuels.

Fig. 5.10 Alberta

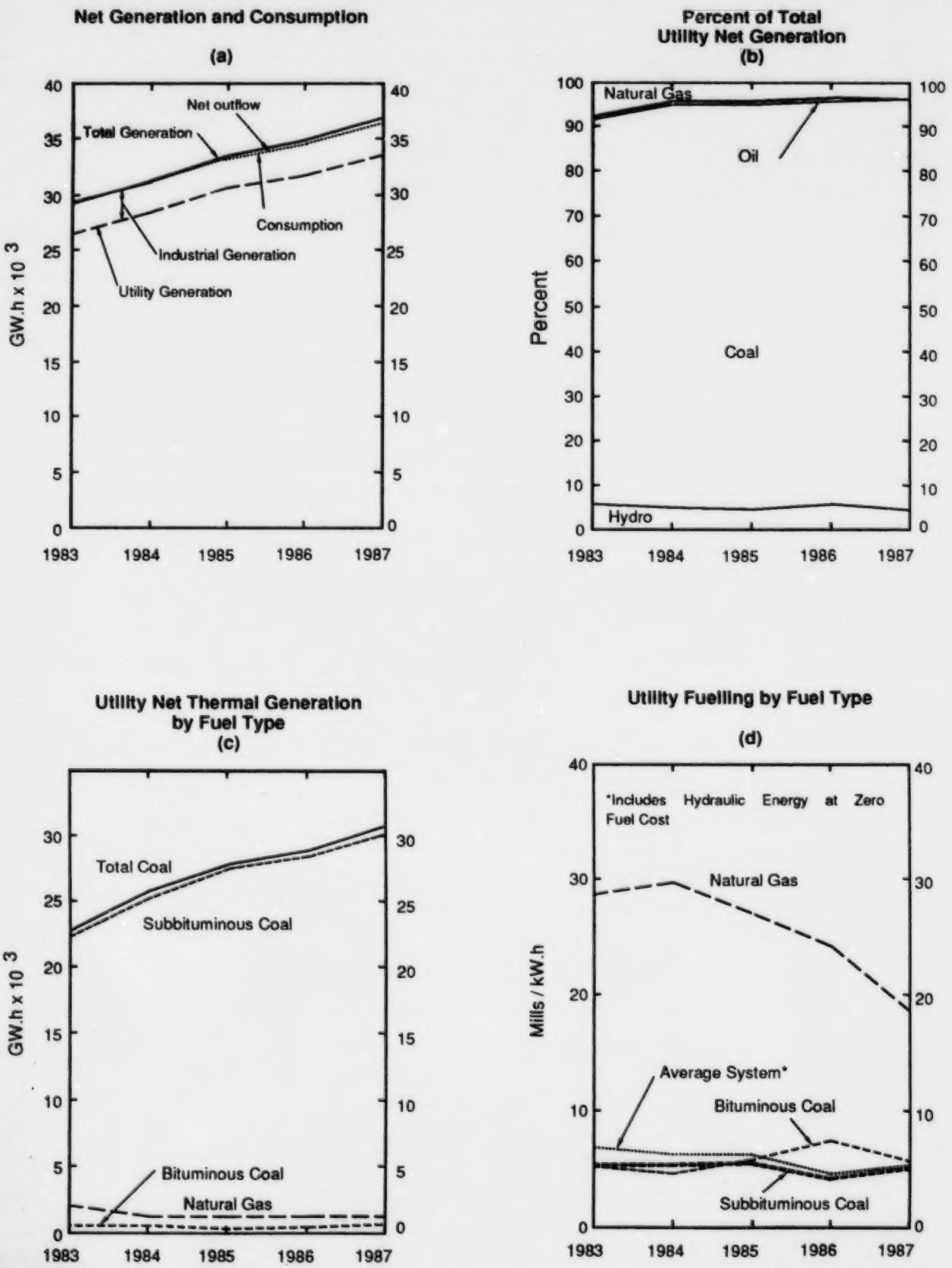
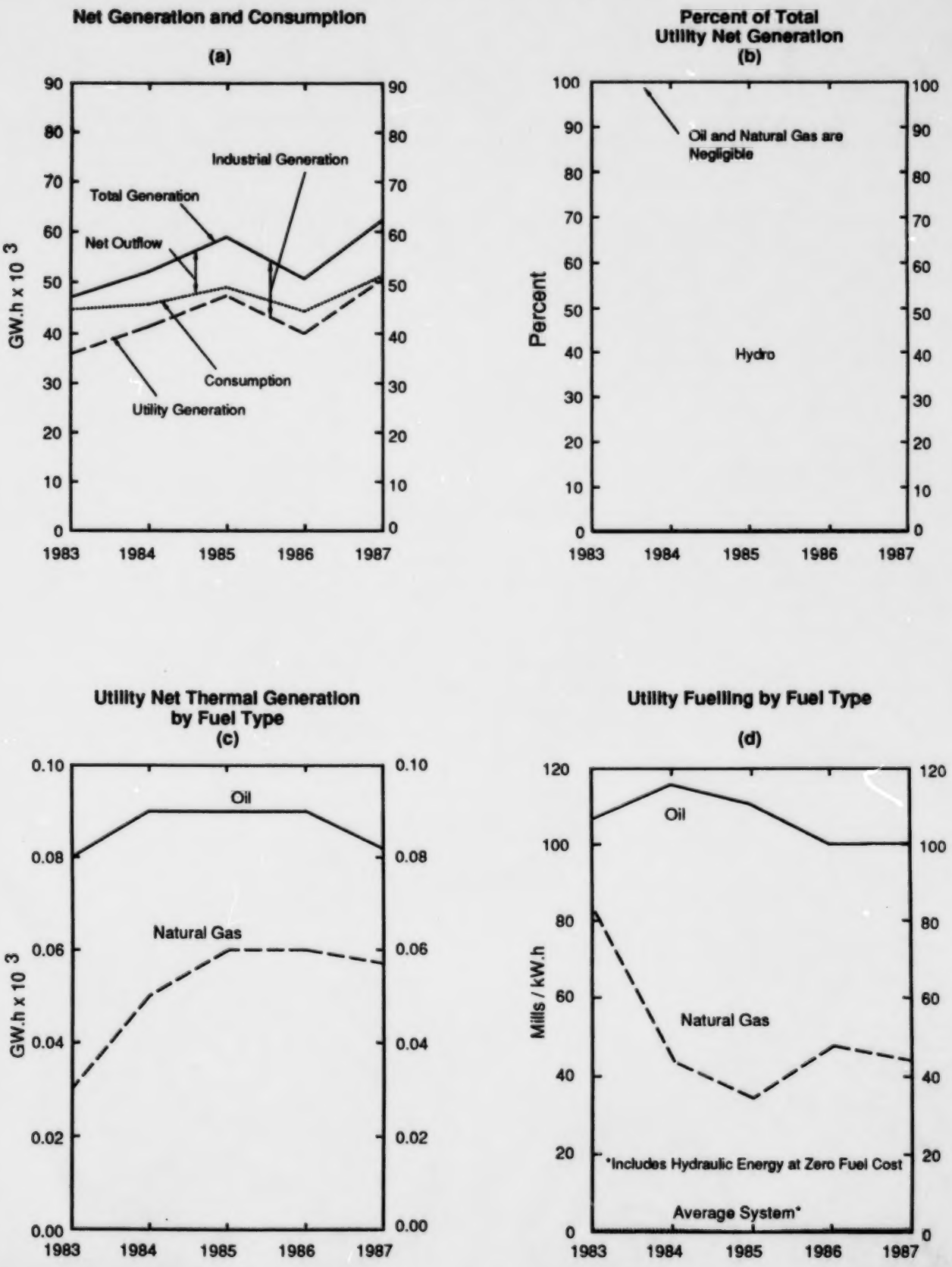


Fig. 5.11 British Columbia



5.12 Yukon

Figure 5.12 (A) shows that 1987 total generation and consumption increased from 344 GW.h in 1986 to 427 GW.h in 1987, an increase of 24.1 percent. Increased mining activity accounts for this significant increase. No industrial self-generation of electricity has been reported since 1979. Figure 5.12 (B) shows that approximately 95 percent of total generation is from hydro sources.

The average system fuel cost in 1987 was 5.3 mills/kW.h, down from 7.6 mills/kW.h in 1986 and down form 10.3 mills/kW.h in 1983. The reduction in the average system fuel cost over the period since 1983 was largely due to the increased use of hydro generation which replaced more expensive oil-fired generation in the interconnected system around Whitehorse. Isolated communities in Yukon rely solely on oil-fired internal combustion units for which fuel costs have been in excess of 100 mills/kW.h in years previous to 1987, although lower world prices for oil reduced generation costs for oil-fired combustion units to 95.2 mills/kW.h in 1987.

5.13 Northwest Territories

As shown in Figure 5.13 (A), total in-territory generation decreased to 538 GW.h in 1987 from 618 GW.h in 1986, a decrease of 12.9 percent. As shown in Figure 5.13 (B) in 1987, approximately 60 percent of total generation was provided for from hydro facilities. The balance of the supply was from the oil-fired internal combustion units mainly located in isolated communities.

Consumption increased steadily from 439 GW.h in 1983 to 618 in 1986, after which it decreased to 538 GW.h in 1987.

The average system fuel cost in 1987 was 48.3 mills/kW.h, down only slightly from 48.7 mills/kW.h in 1986, a decrease of 0.8 percent. Many isolated communities were served solely from oil-fired internal combustion units for which fuel costs exceeded 100 mills/kW.h.

Fig. 5.12 Yukon

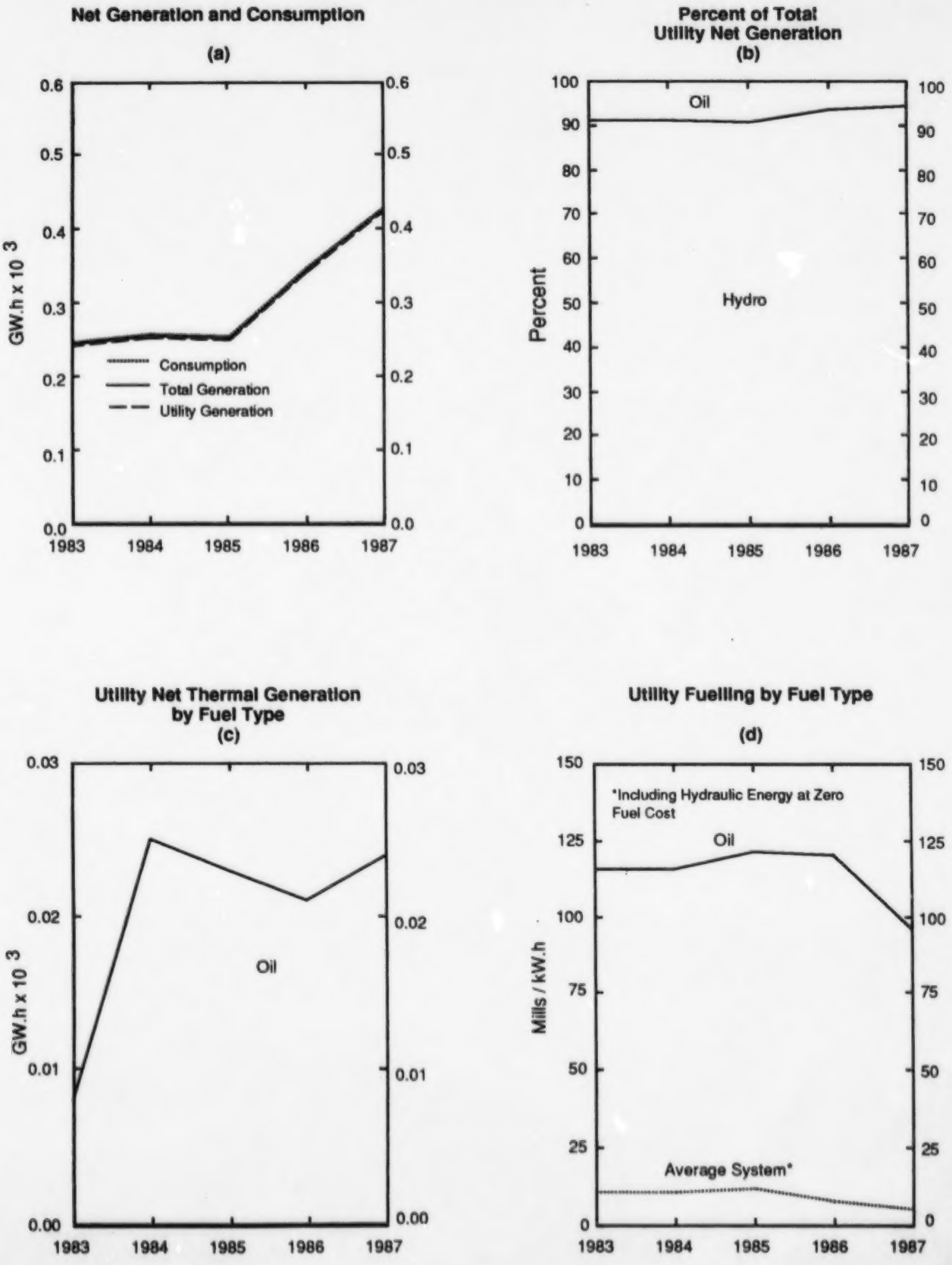
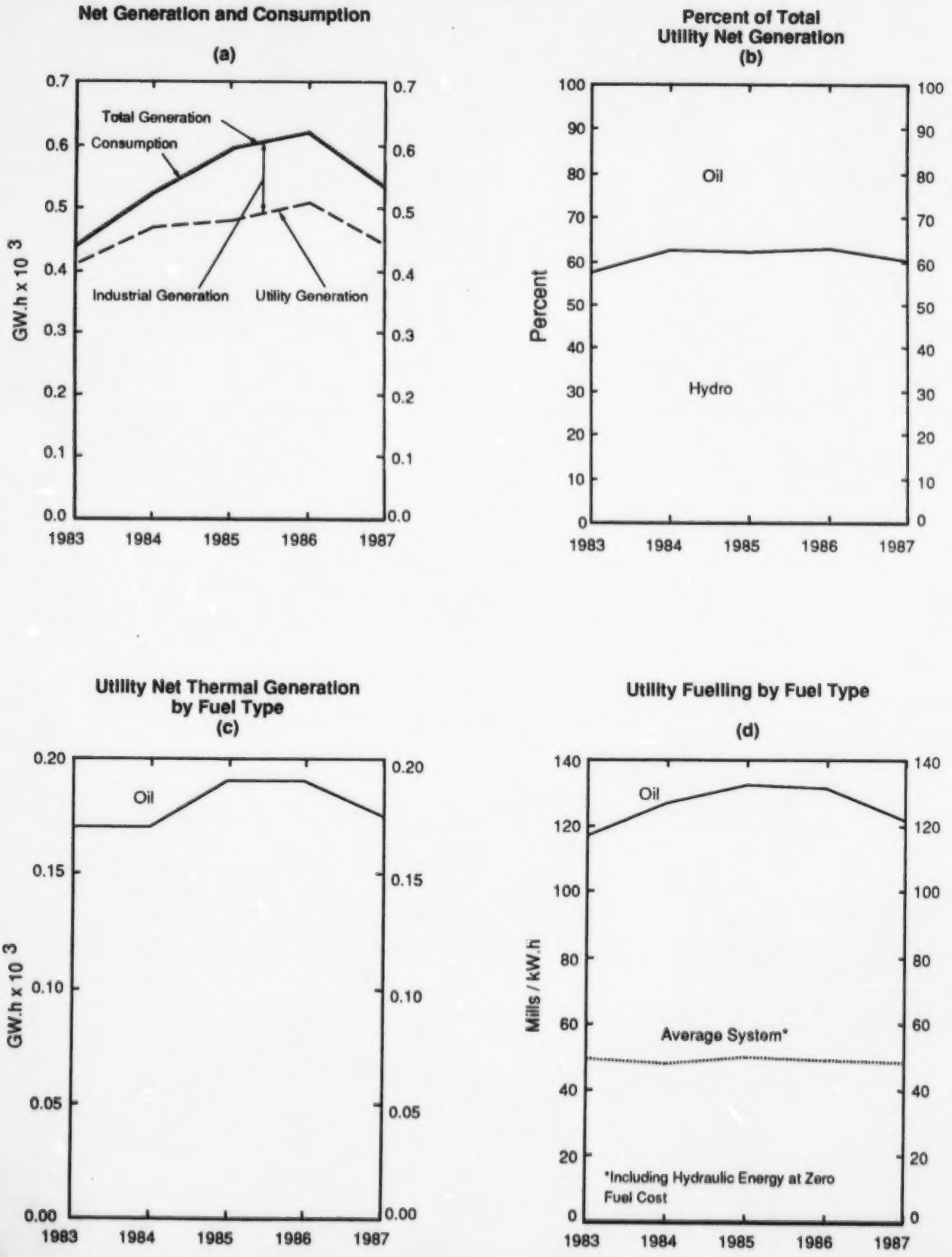


Fig. 5.13 Northwest Territories



6. CANADIAN POPULATION, GROSS NATIONAL PRODUCT AND ELECTRICITY GENERATION TRENDS - 1961 - 1987

In Canada, as in other industrialized nations there is a fundamental linkage between electricity demand and economic activity. Accordingly, we present a historical perspective of this relationship for Canada. Figure 6.1 shows canadian electrical consumption per capita plotted against real Gross National Product (GNP) per capita.

The Board has noted other studies that indicate that there is a relationship between electrical energy consumption per capita and real Gross National Product (GNP) per capita. Accordingly, as a matter of interest, an analysis of this relationship for Canada follows.

Table 6.A provides data on electrical energy consumption, real GNP and population for 1961 to 1987. The average annual compound growth rates are about 6.8 percent, 5.5 percent and 1.7 percent, respectively, for the period 1961 to 1970 inclusive and 5.4 percent, 3.8 percent and 1.2 percent, respectively, for the period 1971 to 1980. The five-year period to 1987 showed average annual compound growth rates of 5.1 percent, 4.2 percent, and 0.8 percent respectively. Figure 6.1 illustrates the regression fit between per capita electricity consumption and per capita real GNP.

Table 6.B provides data on the behavior of the real average price of electricity between 1970 and 1987 (1971 $). The long-term trend exhibited a steady decline until 1974 and an increasing trend to 1979. After leveling off during 1979 and 1980, the average price dropped to 13.3 mills/kW.h (1971 $) in 1981 and rose steadily to 14.3 mills/kW.h in 1985. The average selling price dropped to 13.5 mills/kW.h in 1986 and to 13.3 mills/kW.h in 1987. Over the ten year period to 1987, the real price of electricity was relatively constant at about 13.8 mills/kW.h $\pm$ 0.5 mills.

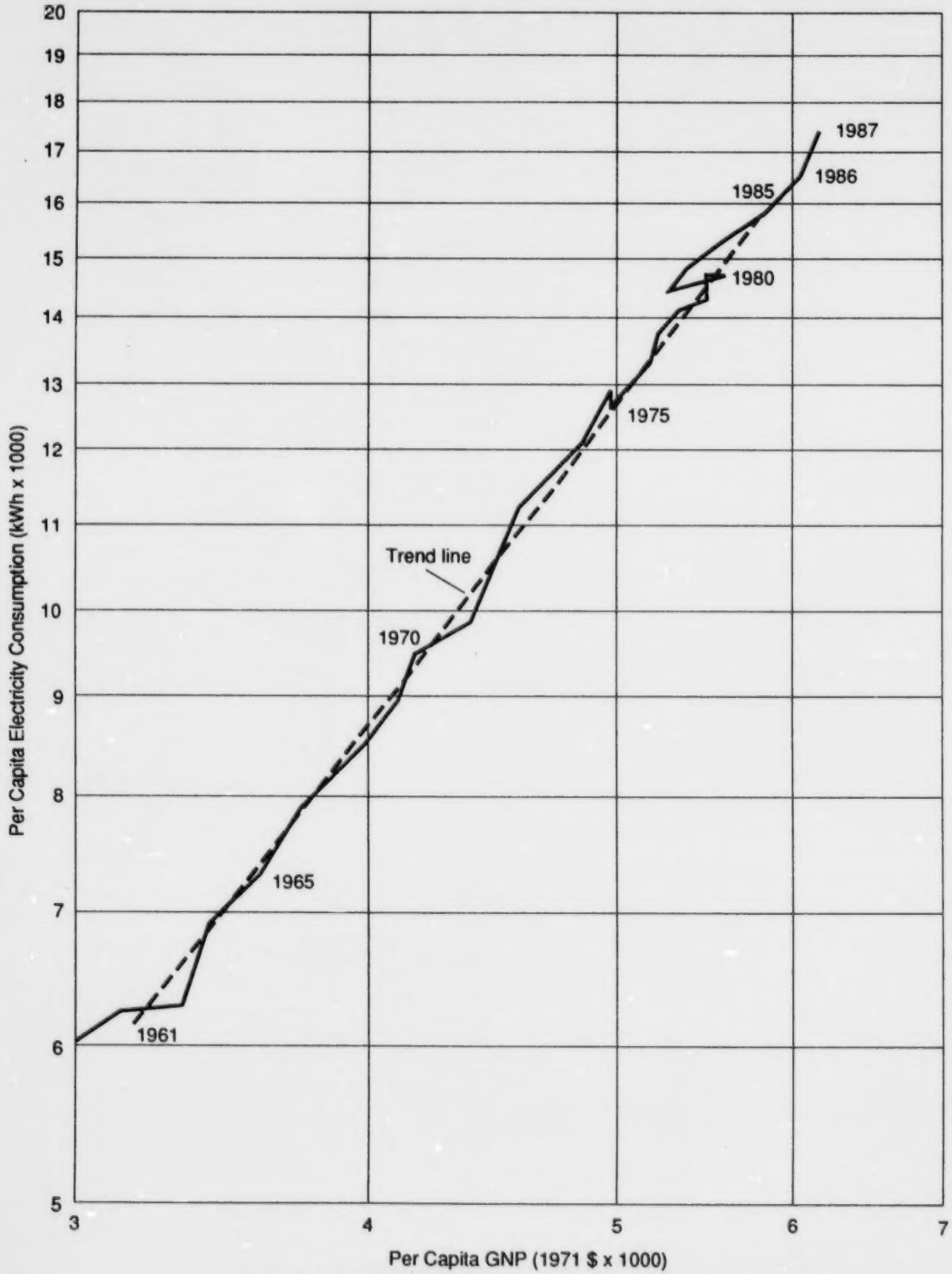


Fig. 6.1 Per Capita Electricity Consumption vs. per Capita GNP

TABLE 6.A

GNP, ELECTRICAL ENERGY CONSUMPTION AND POPULATION FOR CANADA

YEAR	GNP ('000 000 1971$)	ELEC.(*) CONSUMPTION ('000 000 Kw.h))	POPULATION ('000 000)	GNP/CAPITA (1971$)	CONSUMPTION/ CAPITA (kW.h)
1961	54.741	110.950	18.238	3001.5	6083.5
1962	58.473	116.135	18.583	3146.6	6249.5
1963	62.486	121.510	18.931	3300.7	6418.6
1964	65.610	133.949	19.290	3401.2	6944.0
1965	69.981	144.165	19.644	3562.5	7338.9
1966	74.844	156.956	20.015	3739.4	7841.9
1967	77.344	165.812	20.378	3795.5	8136.8
1968	81.864	175.849	20.701	3954.6	8494.7
1969	86.225	188.648	21.001	4105.8	8982.8
1970	88.390	201.298	21.297	4150.3	9451.9
1971	94.450	211.492	21.568	4379.2	9805.8
1972	100.248	231.557	21.802	4598.1	10620.9
1973	107.812	249.298	22.042	4891.1	11310.1
1974	111.687	267.298	22.364	4993.7	11952.2
1975	113.005	265.995	22.697	4978.9	11717.6
1976	119.612	284.829	22.993	5202.1	12387.6
1977	121.988	299.929	23.273	5241.6	12887.4
1978	126.347	316.827	23.517	5372.6	13472.3
1979	130.362	323.469	23.747	5489.6	13621.4
1980	131.765	340.068	24.043	5480.4	14144.2
1981	136.108	346.332	24.342	5591.5	14277.8
1982	130.065	345.437	24.583	5290.9	14051.9
1983	134.361	359.751	24.787	5420.6	14513.7
1984	141.097	386.322	24.979	5648.6	15465.9
1985	147.326	406.859	25.165	5854.4	16167.7
1986	152.830	432.029	25.353	6028.1	17040.5
1987	158.564	439.599	25.625	6187.9	17155.1

(*) Total made available in Canada.

TABLE 6.B

AVERAGE SELLING PRICE OF ELECTRICITY

YEAR	REVENUE '000 000	SALES(*) '000 000 kW.h	MILLS/kW.h (CURRENT $)	C.P.I.(**) DEFLATOR	MILLS/kW.h (1971 $)
1970	1 716	137 972	12.4	0.972	12.8
1971	1 878	147 203	12.8	1.000	12.8
1972	2 065	162 729	12.7	1.048	12.1
1973	2 326	177 724	13.1	1.127	11.6
1974	2 677	193 329	13.8	1.250	11.0
1975	3 114	194 571	16.0	1.385	11.6
1976	3 852	213 612	18.0	1.489	12.1
1977	4 842	226 004	21.4	1.608	13.3
1978	5 612	235 975	23.8	1.752	13.6
1979	6 425	245 537	26.2	1.912	13.7
1980	7 355	254 684	28.9	2.106	13.7
1981	8 371	265 930	31.5	2.369	13.3
1982	9 684	264 289	36.6	2.625	13.9
1983	10 722	272 555	39.3	2.777	14.2
1984	12 150	295 852	41.1	2.898	14.2
1985	13 437	312 773	43.0	3.014	14.3
1986	14 853	350 134	42.4	3.137	13.5
1987	15 935	366 727	43.5	3.275	13.3

(*) Total sales to ultimate customers.

(**) C.P.I. Deflator in 1971$.

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APPENDIX

TABLE 1.1

ELECTRIC UTILITIES
PROVINCIAL INSTALLED CAPACITY AND GENERATION
BY PRIMARY ENERGY SOURCE
1987

PROVINCE OR TERRITORY	FOSSIL FUELLED		NUCLEAR		HYDROELECTRIC		TOTAL	
	MW	GWH	MW	GWH	MW	GWH	MW	GWH
NEWFOUNDLAND	1226.6	2394.8	0.0	0.0	6344.9	36394.1	7571.4	38788.9
PRINCE EDWARD ISLAND	122.5	58.0	0.0	0.0	0.0	0.0	122.5	58.0
NOVA SCOTIA	1907.3	6648.1	0.0	0.0	381.4	723.2	2288.7	7371.3
NEW BRUNSWICK	1759.1	4616.0	680.0	5106.6	849.8	2087.1	3288.9	11809.8
QUÉBEC	1055.9	176.8	685.0	4659.9	22901.6	132313.3	24642.5	137149.9
ONTARIO	13257.4	31759.4	11188.0	63116.0	7120.4	31806.9	31565.8	126682.3
MANITOBA	475.6	538.9	0.0	0.0	3641.1	19312.1	4116.8	19851.0
SASKATCHEWAN	1933.3	8901.6	0.0	0.0	832.6	3188.9	2765.9	12090.5
ALBERTA	6474.1	32209.4	0.0	0.0	733.7	1450.4	7207.8	33659.8
BRITISH COLUMBIA	1127.1	138.8	0.0	0.0	9340.7	50490.1	10467.8	50628.8
YUKON	40.5	23.6	0.0	0.0	80.1	403.2	120.6	426.8
NORTHWEST TERRITORIES	139.0	175.8	0.0	0.0	50.0	268.0	189.0	443.8
CANADA	29518.4	87641.1	12553.0	72882.5	52276.2	278437.3	94347.6	438960.9

NOTE: 1. FOR BREAKDOWN OF FOSSIL FUELLED, SEE TABLE 1.4.

TABLE 1.2

ELECTRIC UTILITIES
PROVINCIAL INSTALLED CAPACITY AND GENERATION
BY PRIMARY ENERGY SOURCE
PERCENT OF CANADIAN TOTALS
1987

PROVINCE OR TERRITORY	FOSSIL FUELLED		NUCLEAR		HYDROELECTRIC		TOTAL	
	MW	GWH	MW	GWH	MW	GWH	MW	GWH
NEWFOUNDLAND	4.2	2.7	0.0	0.0	12.1	13.1	8.0	8.8
PRINCE EDWARD ISLAND	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.0
NOVA SCOTIA	6.5	7.6	0.0	0.0	0.7	0.3	2.4	1.7
NEW BRUNSWICK	6.0	5.3	5.4	7.0	1.6	0.7	3.5	2.7
QUÉBEC	3.6	0.2	5.5	6.4	43.8	47.5	26.1	31.2
ONTARIO	44.9	36.2	89.1	86.6	13.6	11.4	33.5	28.9
MANITOBA	1.6	0.6	0.0	0.0	7.0	6.9	4.4	4.5
SASKATCHEWAN	6.5	10.2	0.0	0.0	1.6	1.1	2.9	2.8
ALBERTA	21.9	36.8	0.0	0.0	1.4	0.5	7.6	7.7
BRITISH COLUMBIA	3.8	0.2	0.0	0.0	17.9	18.1	11.1	11.5
YUKON	0.1	0.0	0.0	0.0	0.2	0.1	0.1	0.1
NORTHWEST TERRITORIES	0.5	0.2	0.0	0.0	0.1	0.1	0.2	0.1
CANADA	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

NOTE: 1. FOR BREAKDOWN OF FOSSIL FUELLED, SEE TABLE 1.5.

TABLE 1.3

ELECTRIC UTILITIES
PROVINCIAL INSTALLED CAPACITY AND GENERATION
BY PRIMARY ENERGY SOURCE
PERCENT OF PROVINCIAL TOTALS
1987

PROVINCE OR TERRITORY	FOSSIL FUELLED		NUCLEAR		HYDROELECTRIC		TOTAL	
	MW	GWH	MW	GWH	MW	GWH	MW	GWH
NEWFOUNDLAND	16.2	6.2	0.0	0.0	83.8	93.8	100.0	100.0
PRINCE EDWARD ISLAND	100.0	100.0	0.0	0.0	0.0	0.0	100.0	100.0
NOVA SCOTIA	83.3	90.2	0.0	0.0	16.7	9.8	100.0	100.0
NEW BRUNSWICK	53.5	39.1	20.7	43.2	25.8	17.7	100.0	100.0
QUÉBEC	4.3	0.1	2.8	3.4	92.9	96.5	100.0	100.0
ONTARIO	42.0	25.1	35.4	49.8	22.6	25.1	100.0	100.0
MANITOBA	11.6	2.7	0.0	0.0	88.4	97.3	100.0	100.0
SASKATCHEWAN	69.9	73.6	0.0	0.0	30.1	26.4	100.0	100.0
ALBERTA	89.8	95.7	0.0	0.0	10.2	4.3	100.0	100.0
BRITISH COLUMBIA	10.8	0.3	0.0	0.0	89.2	99.7	100.0	100.0
YUKON	33.6	5.5	0.0	0.0	66.4	94.5	100.0	100.0
NORTHWEST TERRITORIES	73.5	39.6	0.0	0.0	26.5	60.4	100.0	100.0
CANADA	**31.3**	**20.0**	**13.3**	**16.8**	**55.4**	**63.4**	**100.0**	**100.0**

NOTE: 1. FOR BREAKDOWN OF FOSSIL FUELLED, SEE TABLE 1.6.

TABLE 1.4

ELECTRIC UTILITIES
PROVINCIAL FOSSIL CAPACITY AND GENERATION
1987

PROVINCE OR TERRITORY	GENERATION(GWH)						CAPACITY (MW)		
	STEAM			INT	GAS	TOTAL	MULTI	NON MULTI	TOTAL
	OIL	GAS	COAL	COMB	TURBINE		FUELLED	FUELLED	
NEWFOUNDLAND	2240.9	0.0	0.0	102.2	51.6	2394.8	0.0	1226.6	1226.6
PRINCE EDWARD ISLAND	50.6	0.0	0.0	1.6	5.8	58.0	0.0	122.5	122.5
NOVA SCOTIA	1345.7	0.0	5292.9	0.0	9.5	6648.1	0.0	1907.3	1907.3
NEW BRUNSWICK	3319.4	0.0	1294.6	0.2	1.8	4616.0	0.0	1759.1	1759.1
QUÉBEC	-24.1	0.0	0.0	204.8	-4.0	176.8	0.0	1055.9	1055.9
ONTARIO	131.5	3.1	31612.0	1.5	11.2	31759.4	0.0	13257.4	13257.4
MANITOBA	1.0	2.2	509.2	26.5	0.0	538.9	0.0	475.6	475.6
SASKATCHEWAN	7.5	80.0	8781.6	7.0	25.5	8901.6	0.0	1933.3	1933.3
ALBERTA	1.1	741.8	30890.7	49.6	526.1	32209.4	0.0	6474.1	6474.1
BRITISH COLUMBIA	0.0	-3.6	0.0	143.5	-1.2	138.8	0.0	1127.1	1127.1
YUKON	0.0	0.0	0.0	23.6	0.0	23.6	0.0	40.5	40.5
NORTHWEST TERRITORIES	0.0	0.0	0.0	175.8	0.0	175.8	0.0	139.0	139.0
CANADA	7073.6	823.6	78381.0	736.5	626.4	87641.1	0.0	29518.4	29518.4

TABLE 1.5

ELECTRIC UTILITIES
PROVINCIAL FOSSIL CAPACITY AND GENERATION
PERCENT OF CANADIAN TOTALS
1987

PROVINCE OR TERRITORY	GENERATION(GWH)						CAPACITY (MW)		
	STEAM			INT COMB	GAS TURBINE	TOTAL	MULTI FUELLED	NON MULTI FUELLED	TOTAL
	OIL	GAS	COAL						
NEWFOUNDLAND	31.7	0.0	0.0	13.9	8.2	2.7	0.0	4.2	4.2
PRINCE EDWARD ISLAND	0.7	0.0	0.0	0.2	0.9	0.1	0.0	0.4	0.4
NOVA SCOTIA	19.0	0.0	6.8	0.0	1.5	7.6	0.0	6.5	6.5
NEW BRUNSWICK	46.9	0.0	1.7	0.0	0.3	5.3	0.0	6.0	6.0
QUÉBEC	-0.3	0.0	0.0	27.8	-0.6	0.2	0.0	3.6	3.6
ONTARIO	1.9	0.4	40.3	0.2	1.8	36.2	0.0	44.9	44.9
MANITOBA	0.0	0.3	0.6	3.6	0.0	0.6	0.0	1.6	1.6
SASKATCHEWAN	0.1	9.7	11.2	1.0	4.1	10.2	0.0	6.5	6.5
ALBERTA	0.0	90.1	39.4	6.7	84.0	36.8	0.0	21.9	21.9
BRITISH COLUMBIA	0.0	-0.4	0.0	19.5	-0.2	0.2	0.0	3.8	3.8
YUKON	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.1	0.1
NORTHWEST TERRITORIES	0.0	0.0	0.0	23.9	0.0	0.2	0.0	0.5	0.5
CANADA	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0	100.0

TABLE 1.6

ELECTRIC UTILITIES
PROVINCIAL FOSSIL CAPACITY AND GENERATION
PERCENT OF PROVINCIAL TOTALS
1987

PROVINCE OR TERRITORY	GENERATION(GWH)						CAPACITY (MW)		
	STEAM			INT	GAS	TOTAL	MULTI	NON MULTI	TOTAL
	OIL	GAS	COAL	COMB	TURBINE		FUELLED	FUELLED	
NEWFOUNDLAND	93.6	0.0	0.0	4.3	2.2	100.0	0.0	100.0	100.0
PRINCE EDWARD ISLAND	87.2	0.0	0.0	2.8	9.9	100.0	0.0	100.0	100.0
NOVA SCOTIA	20.2	0.0	79.6	0.0	0.1	100.0	0.0	100.0	100.0
NEW BRUNSWICK	71.9	0.0	28.0	0.0	0.0	100.0	0.0	100.0	100.0
QUÉBEC	-13.6	0.0	0.0	115.9	-2.3	100.0	0.0	100.0	100.0
ONTARIO	0.4	0.0	99.5	0.0	0.0	100.0	0.0	100.0	100.0
MANITOBA	0.2	0.4	94.5	4.9	0.0	100.0	0.0	100.0	100.0
SASKATCHEWAN	0.1	0.9	98.7	0.1	0.3	100.0	0.0	100.0	100.0
ALBERTA	0.0	2.3	95.9	0.2	1.6	100.0	0.0	100.0	100.0
BRITISH COLUMBIA	0.0	-2.6	0.0	103.4	-0.8	100.0	0.0	100.0	100.0
YUKON	0.0	0.0	0.0	100.0	0.0	100.0	0.0	100.0	100.0
NORTHWEST TERRITORIES	0.0	0.0	0.0	100.0	0.0	100.0	0.0	100.0	100.0
CANADA	8.1	0.9	89.4	0.8	0.7	100.0	0.0	100.0	100.0

TABLE 1.7

ELECTRIC UTILITIES
PROVINCIAL GENERATION BY TYPE OF COAL AND OIL (GW.H)
1987

PROVINCE OR TERRITORY	COAL					OIL			
	BITUMINOUS CANADIAN	BITUMINOUS IMPORTED	SUBBITUMINOUS	LIGNITE	TOTAL COAL	LIGHT	HEAVY	DIESEL	TOTAL OIL
NEWFOUNDLAND	0.0	0.0	0.0	0.0	0.0	51.5	2239.7	103.6	2394.8
PRINCE EDWARD ISLAND	0.0	0.0	0.0	0.0	0.0	0.0	51.2	6.8	58.0
NOVA SCOTIA	5292.9	0.0	0.0	0.0	5292.9	11.8	1333.9	9.5	1355.2
NEW BRUNSWICK	1294.6	0.0	0.0	0.0	1294.6	9.4	3310.0	2.0	3321.4
QUÉBEC	0.0	0.0	0.0	0.0	0.0	64.2	35.5	77.1	176.8
ONTARIO	6838.8	22457.1	0.0	2316.1	31612.0	120.6	22.4	0.3	143.3
MANITOBA	0.0	0.0	0.0	509.2	509.2	1.0	0.0	26.5	27.5
SASKATCHEWAN	0.0	0.0	0.0	8781.6	8781.6	7.5	0.0	7.0	14.6
ALBERTA	664.2	0.0	30226.5	0.0	30890.7	0.0	0.0	13.1	13.1
BRITISH COLUMBIA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	82.2	82.2
YUKON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.6	23.6
NORTHWEST TERRITORIES	0.0	0.0	0.0	0.0	0.0	0.0	15.4	160.4	175.8
CANADA	14090.5	22457.1	30226.5	11606.9	78381.0	266.0	7008.0	512.3	7786.3

TABLE 1.8

ELECTRIC UTILITIES
GENERATION DATA FOR CANADA
1987

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GWH	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ KWH
COAL									
-BITUMINOUS	13616.7	27946.2	952451.8	48.3	36547.6	8.3	69.9	2.5	26.1
-SUBBITUMINOUS	18470.2	18439.3	154973.9	7.9	30226.5	6.9	8.4	0.5	5.1
-LIGNITE	9715.9	14653.7	154831.6	7.9	11606.9	2.6	15.9	1.1	13.3
-TOTAL	41802.8	20656.2	1262257.3	64.1	78381.0	17.9	30.2	1.5	16.1
OIL									
-LIGHT	90777.0	38447.2	18894.5	1.0	266.0	0.1	208.1	5.4	71.0
-HEAVY	1816100.0	41683.8	236128.8	12.0	7008.0	1.6	130.0	3.1	33.7
-DIESEL	171489.0	37884.2	55759.1	2.8	512.3	0.1	325.1	8.6	108.8
-TOTAL	2078366.0	41228.9	310782.4	15.8	7786.3	1.8	149.5	3.6	39.9
NATURAL GAS	535.8	38484.3	34826.6	1.8	1473.9	0.3	65.0	1.7	23.6
URANIUM	1299824.0	637035.2	362315.5	18.4	72882.5	16.6	278.7	0.4	5.0
HYDROELECTRIC					278437.3	63.4			
TOTAL			1970181.8	100.0	438961.0	100.0			4.5

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES/KILOGRAM (COAL), KILOJOULES/LITRE (OIL), KILOJOULES/CUBIC METRE (GAS), AND KILOJOULES/GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.1

ELECTRIC UTILITIES
GENERATION DATA FOR NEWFOUNDLAND
1987

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GWH	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ KWH
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OIL									
-LIGHT	21502.0	38489.0	4989.1	5.7	51.5	0.1	232.0	6.0	96.9
-HEAVY	573560.0	41807.0	73774.8	84.0	2239.7	5.8	128.6	3.1	32.9
-DIESEL	33355.0	38457.8	9049.1	10.3	103.6	0.3	271.3	7.1	87.3
-TOTAL	628417.0	41515.7	87812.9	100.0	2394.8	6.2	139.7	3.4	36.7
NATURAL GAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					36394.1	93.8			
TOTAL	-		87812.9	100.0	38788.9	100.0			2.3

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES/KILOGRAM (COAL), KILOJOULES/LITRE (OIL), KILOJOULES/CUBIC METRE (GAS), AND KILOJOULES/GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.2

ELECTRIC UTILITIES
GENERATION DATA FOR PRINCE EDWARD ISLAND
1987

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GWH	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ KWH
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OIL									
-LIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-HEAVY	23654.0	41338.5	3390.5	82.1	51.2	88.2	143.3	3.5	66.3
-DIESEL	3512.0	38574.8	738.3	17.9	6.8	11.8	210.2	5.5	108.1
-TOTAL	27166.0	40981.2	4128.7	100.0	58.0	100.0	152.0	3.7	71.2
NATURAL GAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					0.0	0.0			
TOTAL			4128.7	100.0	58.0	100.0			71.2

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES/KILOGRAM (COAL), KILOJOULES/LITRE (OIL), KILOJOULES/CUBIC METRE (GAS), AND KILOJOULES/GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.3

ELECTRIC UTILITIES
GENERATION DATA FOR NOVA SCOTIA
1987

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GWH	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ KWH
COAL									
-BITUMINOUS	2076.9	27150.5	147606.2	75.9	5292.9	71.8	71.1	2.6	27.9
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	2076.9	27150.5	147606.2	75.9	5292.9	71.8	71.1	2.6	27.9
OIL									
-LIGHT	3594.0	37592.7	697.8	0.4	11.8	0.2	194.1	5.2	59.1
-HEAVY	342429.0	41837.1	45268.5	23.3	1333.9	18.1	132.2	3.2	33.9
-DIESEL	3938.0	37581.3	808.1	0.4	9.5	0.1	205.2	5.5	85.0
-TOTAL	349961.0	41745.6	46774.4	24.1	1355.2	18.4	133.7	3.2	34.5
NATURAL GAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					723.2	9.8			
TOTAL			194380.6	100.0	7371.3	100.0			26.4

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES/KILOGRAM (COAL), KILOJOULES/LITRE (OIL), KILOJOULES/CUBIC METRE (GAS), AND KILOJOULES/GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.4

ELECTRIC UTILITIES
GENERATION DATA FOR NEW BRUNSWICK
1987

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GWH	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ KWH
COAL									
-BITUMINOUS	526.1	26901.0	37295.9	22.8	1294.6	11.0	70.9	2.6	28.8
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	526.1	26901.0	37295.9	22.8	1294.6	11.0	70.9	2.6	28.8
OIL									
-LIGHT	4074.0	38741.0	786.2	0.5	9.4	0.1	193.0	5.0	83.7
-HEAVY	838240.0	41409.0	108051.5	66.2	3310.0	28.0	128.9	3.1	32.6
-DIESEL	1872.0	39139.0	433.1	0.3	2.0	0.0	231.3	5.9	215.0
-TOTAL	844186.0	41391.1	109270.8	66.9	3321.4	28.1	129.4	3.1	32.9
NATURAL GAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	99250.0	576200.0	16722.2	10.2	5106.6	43.2	168.5	0.3	3.3
HYDROELECTRIC					2087.1	17.7			
TOTAL			163289.0	100.0	11809.7	100.0			13.8

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES/KILOGRAM (COAL), KILOJOULES/LITRE (OIL), KILOJOULES/CUBIC METRE (GAS), AND KILOJOULES/GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.5

ELECTRIC UTILITIES
GENERATION DATA FOR QUÉBEC
1987

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GWH	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ KWH
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OIL									
-LIGHT	22132.0	38830.4	4920.2	16.8	64.2	0.0	222.3	5.7	76.7
-HEAVY	27055.0	45780.3	3072.9	10.5	35.5	0.0	113.6	2.5	86.7
-DIESEL	25666.0	37957.4	8976.9	30.6	77.1	0.1	349.8	9.2	116.4
-TOTAL	74853.0	41043.0	16970.0	57.8	176.8	0.1	226.7	5.5	96.0
NATURAL GAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	87052.0	670000.0	12390.1	42.2	4659.9	3.4	142.3	0.2	2.7
HYDROELECTRIC					132313.3	96.5			
TOTAL			29360.1	100.0	137149.9	100.0			0.2

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES/KILOGRAM (COAL), KILOJOULES/LITRE (OIL), KILOJOULES/CUBIC METRE (GAS), AND KILOJOULES/GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.6

ELECTRIC UTILITIES
GENERATION DATA FOR ONTARIO
1987

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GWH	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ KWH
COAL									
-BITUMINOUS	10406.9	28735.5	763667.6	65.5	29295.9	23.1	73.4	2.6	26.1
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	1582.8	15904.4	61169.2	5.2	2316.1	1.8	38.6	2.4	26.4
-TOTAL	11989.7	27041.7	824836.8	70.7	31612.0	25.0	68.8	2.5	26.1
OIL									
-LIGHT	36748.0	38330.7	6854.1	0.6	120.6	0.1	186.5	4.9	56.8
-HEAVY	7000.0	41600.0	1349.8	0.1	22.4	0.0	192.8	4.6	60.4
-DIESEL	127.0	37705.0	32.8	0.0	0.3	0.0	258.4	6.9	106.6
-TOTAL	43875.0	38850.5	8236.7	0.7	143.3	0.1	187.7	4.8	57.5
NATURAL GAS	1.3	37348.7	231.7	0.0	4.0	0.0	181.0	4.9	57.7
URANIUM	1113522.0	639880.5	333203.1	28.6	63116.0	49.8	299.2	0.5	5.3
HYDROELECTRIC					31806.9	25.1			
TOTAL			1166508.3	100.0	126682.3	100.0			9.2

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES/KILOGRAM (COAL), KILOJOULES/LITRE (OIL), KILOJOULES/CUBIC METRE (GAS), AND KILOJOULES/GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.7

ELECTRIC UTILITIES
GENERATION DATA FOR MANITOBA
1987

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GWH	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ KWH
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	460.8	16011.2	11728.5	78.3	509.2	2.6	25.5	1.6	23.0
-TOTAL	460.8	16011.2	11728.5	78.3	509.2	2.6	25.5	1.6	23.0
OIL									
-LIGHT	348.0	38076.2	81.5	0.5	1.0	0.0	234.1	6.2	82.5
-HEAVY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-DIESEL	9428.0	38288.9	3038.0	20.3	26.5	0.1	322.2	8.4	114.5
-TOTAL	9776.0	38281.3	3119.5	20.8	27.5	0.1	319.1	8.3	113.3
NATURAL GAS	0.9	37223.0	131.5	0.9	2.2	0.0	145.8	3.9	59.1
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					19312.1	97.3			
TOTAL			14979.6	100.0	19851.0	100.0			0.8

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES/KILOGRAM (COAL), KILOJOULES/LITRE (OIL), KILOJOULES/CUBIC METRE (GAS), AND KILOJOULES/GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.8

ELECTRIC UTILITIES
GENERATION DATA FOR SASKATCHEWAN
1987

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GWH	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ KWH
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	7672.3	14314.2	81933.9	90.0	8781.6	72.6	10.7	0.8	9.3
-TOTAL	7672.3	14314.2	81933.9	90.0	8781.6	72.6	10.7	0.8	9.3
OIL									
-LIGHT	2379.0	37145.9	565.8	0.6	7.5	0.1	237.8	6.4	75.2
-HEAVY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-DIESEL	2452.0	38000.0	907.4	1.0	7.0	0.1	370.0	9.7	129.1
-TOTAL	4831.0	37579.4	1473.1	1.6	14.6	0.1	304.9	8.1	101.2
NATURAL GAS	44.0	38391.6	7633.3	8.4	105.5	0.9	173.6	4.5	72.4
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					3188.9	26.4			
TOTAL			91040.3	100.0	12090.5	100.0			7.5

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES/KILOGRAM (COAL), KILOJOULES/LITRE (OIL), KILOJOULES/CUBIC METRE (GAS), AND KILOJOULES/GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.9

ELECTRIC UTILITIES
GENERATION DATA FOR ALBERTA
1987

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GWH	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ KWH
COAL									
-BITUMINOUS	606.8	18040.0	3882.2	2.1	684.2	2.0	6.4	0.4	5.8
-SUBBITUMINOUS	18470.2	18439.3	154973.9	84.1	30226.5	89.8	8.4	0.5	5.1
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	19077.0	18426.6	158856.1	86.2	30890.7	91.8	8.3	0.5	5.1
OIL									
-LIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-HEAVY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-DIESEL	4097.0	37880.0	1081.7	0.6	13.1	0.0	264.0	7.0	82.5
-TOTAL	4097.0	37880.0	1081.7	0.6	13.1	0.0	264.0	7.0	82.5
NATURAL GAS	470.6	38544.2	24340.4	13.2	1305.6	3.9	51.7	1.3	18.6
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					1450.4	4.3			
TOTAL			184278.1	100.0	33659.8	100.0			5.5

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES/KILOGRAM (COAL), KILOJOULES/LITRE (OIL), KILOJOULES/CUBIC METRE (GAS), AND KILOJOULES/GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.10

ELECTRIC UTILITIES
GENERATION DATA FOR BRITISH COLUMBIA
1987

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GWH	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ KWH
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OIL									
-LIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-HEAVY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-DIESEL	26833.0	36132.8	8239.0	76.8	82.2	0.2	307.0	8.5	100.2
-TOTAL	26833.0	36132.8	8239.0	76.8	82.2	0.2	307.0	8.5	100.2
NATURAL GAS	19.0	37352.3	2489.7	23.2	56.5	0.1	131.0	3.5	44.0
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					50490.1	99.7			
TOTAL			10728.7	100.0	50628.9	100.0			0.2

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES/KILOGRAM (COAL), KILOJOULES/LITRE (OIL), KILOJOULES/CUBIC METRE (GAS), AND KILOJOULES/GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.11

ELECTRIC UTILITIES
GENERATION DATA FOR YUKON
1987

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GWH	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ KWH
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OIL									
-LIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-HEAVY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-DIESEL	6918.0	37880.0	2245.0	100.0	23.6	5.5	324.5	8.6	95.2
-TOTAL	6918.0	37880.0	2245.0	100.0	23.6	5.5	324.5	8.6	95.2
NATURAL GAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					403.2	94.5			
TOTAL			2245.0	100.0	426.8	100.0			5.3

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES/KILOGRAM (COAL), KILOJOULES/LITRE (OIL), KILOJOULES/CUBIC METRE (GAS), AND KILOJOULES/GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 2.12

ELECTRIC UTILITIES
GENERATION DATA FOR NORTHWEST TERRITORIES
1987

FUEL	QUANTITY CONSUMED (1)	AVERAGE HEAT CONTENT (2)	COST $('000)	% TOTAL FUEL COST	GENERATION GWH	% TOTAL GENERATION	COST/UNIT QUANTITY (3)	COST $/GJ	MILLS/ KWH
COAL									
-BITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-SUBBITUMINOUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-LIGNITE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OIL									
-LIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-HEAVY	4162.0	42924.0	1220.8	5.7	15.4	3.5	293.3	6.8	79.4
-DIESEL	53291.0	38228.8	20209.7	94.3	160.4	36.1	379.2	9.9	126.0
-TOTAL	57453.0	38568.9	21430.5	100.0	175.8	39.6	373.0	9.7	121.9
NATURAL GAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
URANIUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HYDROELECTRIC					268.0	60.4			
TOTAL			21430.5	100.0	443.8	100.0			48.3

NOTE: (1) QUANTITY CONSUMED IS MEASURED IN THOUSANDS OF TONNES (COAL), KILOLITRES (OIL), MILLIONS OF CUBIC METRES(GAS), AND KILOGRAMS (CONTAINED URANIUM).

(2) AVERAGE HEAT CONTENT IS MEASURED IN KILOJOULES/KILOGRAM (COAL), KILOJOULES/LITRE (OIL), KILOJOULES/CUBIC METRE (GAS), AND KILOJOULES/GRAM (CONTAINED URANIUM).

(3) UNIT QUANTITY IS MEASURED IN TONNES (COAL), KILOLITRES (OIL), THOUSANDS OF CUBIC METRES (GAS), AND KILOGRAMS (CONTAINED URANIUM).

TABLE 3.1

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
BITUMINOUS COAL
1987

PROVINCE OR TERRITORY	QUANTITY TONNES	HEAT CONTENT KJ/KG	COST '000 $	GENERATION GWH	COST $/TONNE	COST $/GJ	COST MILLS/KWH
NEWFOUNDLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
PRINCE EDWARD ISLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NOVA SCOTIA	2076896.0	27150.5	147606.2	5292.9	71.071	2.618	27.89
NEW BRUNSWICK	526090.0	26901.0	37295.9	1294.6	70.893	2.635	28.81
QUÉBEC	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ONTARIO	10406918.0	28735.5	763667.6	29295.9	73.381	2.554	26.07
MANITOBA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
SASKATCHEWAN	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ALBERTA	606800.0	18040.0	3882.2	664.2	6.398	0.355	5.84
BRITISH COLUMBIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
YUKON	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NORTHWEST TERRITORIES	0.0	0.0	0.0	0.0	0.000	0.000	0.00
CANADA	**13616704.0**	**27948.2**	**952451.8**	**36547.6**	**69.947**	**2.503**	**26.06**

TABLE 3.2

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
SUBBITUMINOUS COAL
1987

PROVINCE OR TERRITORY	QUANTITY TONNES	HEAT CONTENT KJ/KG	COST '000 $	GENERATION GWH	COST		
					$/TONNE	$/GJ	MILLS/KWH
NEWFOUNDLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
PRINCE EDWARD ISLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NOVA SCOTIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NEW BRUNSWICK	0.0	0.0	0.0	0.0	0.000	0.000	0.00
QUÉBEC	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ONTARIO	0.0	0.0	0.0	0.0	0.000	0.000	0.00
MANITOBA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
SASKATCHEWAN	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ALBERTA	18470218.0	18439.3	154973.9	30226.5	8.390	0.455	5.13
BRITISH COLUMBIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
YUKON	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NORTHWEST TERRITORIES	0.0	0.0	0.0	0.0	0.000	0.000	0.00
CANADA	18470218.0	18439.3	154973.9	30226.5	8.390	0.455	5.13

TABLE 3.3

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
LIGNITE
1987

PROVINCE OR TERRITORY	QUANTITY TONNES	HEAT CONTENT KJ/KG	COST '000 $	GENERATION GWH	COST $/TONNE	COST $/GJ	COST MILLS/KWH
NEWFOUNDLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
PRINCE EDWARD ISLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NOVA SCOTIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NEW BRUNSWICK	0.0	0.0	0.0	0.0	0.000	0.000	0.00
QUÉBEC	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ONTARIO	1582753.0	15904.4	61169.2	2316.1	38.647	2.430	26.41
MANITOBA	460793.0	16011.2	11728.5	509.2	25.453	1.590	23.03
SASKATCHEWAN	7672309.0	14314.2	81933.9	8781.6	10.679	0.746	9.33
ALBERTA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
BRITISH COLUMBIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
YUKON	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NORTHWEST TERRITORIES	0.0	0.0	0.0	0.0	0.000	0.000	0.00
CANADA	**9715855.0**	**14653.7**	**154831.6**	**11606.9**	**15.936**	**1.088**	**13.34**

TABLE 3.4

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
LIGHT OIL
1987

PROVINCE OR TERRITORY	QUANTITY KILOLITRES	HEAT CONTENT KJ/LITRE	COST '000 $	GENERATION GWH	COST $/KILOLITRE	COST $/GJ	COST MILLS/KWH
NEWFOUNDLAND	21502.0	38489.0	4989.1	51.5	232.028	6.028	96.90
PRINCE EDWARD ISLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NOVA SCOTIA	3594.0	37592.7	697.8	11.8	194.146	5.164	59.14
NEW BRUNSWICK	4074.0	38741.0	786.2	9.4	192.981	4.981	83.72
QUÉBEC	22132.0	38830.4	4920.2	64.2	222.310	5.725	76.65
ONTARIO	36748.0	38330.7	6854.1	120.6	186.515	4.866	56.81
MANITOBA	348.0	38076.2	81.5	1.0	234.103	6.148	82.54
SASKATCHEWAN	2379.0	37145.9	565.8	7.5	237.817	6.402	75.17
ALBERTA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
BRITISH COLUMBIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
YUKON	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NORTHWEST TERRITORIES	0.0	0.0	0.0	0.0	0.000	0.000	0.00
CANADA	90777.0	38447.2	18894.5	266.0	208.142	5.414	71.03

TABLE 3.5

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
HEAVY OIL
1987

PROVINCE OR TERRITORY	QUANTITY KILOLITRES	HEAT CONTENT KJ/LITRE	COST '000 $	GENERATION GWH	COST $/KILOLITRE	COST $/GJ	COST MILLS/KWH
NEWFOUNDLAND	573560.0	41807.0	73774.8	2239.7	128.626	3.077	32.94
PRINCE EDWARD ISLAND	23654.0	41338.5	3390.5	51.2	143.335	3.467	66.25
NOVA SCOTIA	342429.0	41837.1	45268.5	1333.9	132.198	3.160	33.94
NEW BRUNSWICK	838240.0	41409.0	108051.5	3310.0	128.903	3.113	32.64
QUÉBEC	27055.0	45780.3	3072.9	35.5	113.581	2.481	86.66
ONTARIO	7000.0	41600.0	1349.8	22.4	192.830	4.635	60.36
MANITOBA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
SASKATCHEWAN	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ALBERTA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
BRITISH COLUMBIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
YUKON	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NORTHWEST TERRITORIES	4162.0	42924.0	1220.8	15.4	293.311	6.833	79.37
CANADA	**1816100.0**	**41683.8**	**236128.8**	**7008.0**	**130.020**	**3.119**	**33.69**

TABLE 3.6

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
DIESEL OIL
1987

PROVINCE OR TERRITORY	QUANTITY KILOLITRE	HEAT CONTENT KJ/LITRE	COST '000 $	GENERATION GWH	COST $/KILOLITRE	COST $/GJ	COST MILLS/KWH
NEWFOUNDLAND	33355.0	38457.8	9049.1	103.6	271.297	7.054	87.33
PRINCE EDWARD ISLAND	3512.0	38574.8	738.3	6.8	210.210	5.449	108.14
NOVA SCOTIA	3938.0	37581.3	808.1	9.5	205.216	5.461	85.00
NEW BRUNSWICK	1872.0	39139.0	433.1	2.0	231.345	5.911	215.03
QUÉBEC	25666.0	37957.4	8976.9	77.1	349.758	9.214	116.42
ONTARIO	127.0	37705.0	32.8	0.3	258.409	6.853	106.55
MANITOBA	9428.0	38288.9	3038.0	26.5	322.236	8.416	114.47
SASKATCHEWAN	2452.0	38000.0	907.4	7.0	370.048	9.738	129.12
ALBERTA	4097.0	37880.0	1081.7	13.1	264.011	6.970	82.47
BRITISH COLUMBIA	26833.0	36132.8	8239.0	82.2	307.048	8.498	100.22
YUKON	6918.0	37880.0	2245.0	23.6	324.515	8.567	95.15
NORTHWEST TERRITORIES	53291.0	38228.8	20209.7	160.4	379.234	9.920	125.98
CANADA	**171489.0**	**37884.2**	**55759.1**	**512.3**	**325.147**	**8.583**	**108.84**

TABLE 3.7

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
NATURAL GAS
1987

PROVINCE OR TERRITORY	QUANTITY MILLIONS CULBIC M	HEAT CONTENT KJ/KG	COST '000 $	GENERATION GWH	COST $/'000 CU M	COST $/GJ	COST MILLS/KWH
NEWFOUNDLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
PRINCE EDWARD ISLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NOVA SCOTIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NEW BRUNSWICK	0.0	0.0	0.0	0.0	0.000	0.000	0.00
QUÉBEC	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ONTARIO	1.3	37348.7	231.7	4.0	181.036	4.847	57.69
MANITOBA	0.9	37223.0	131.5	2.2	145.824	3.918	59.06
SASKATCHEWAN	44.0	38391.6	7633.3	105.5	173.633	4.523	72.35
ALBERTA	470.6	38544.2	24340.4	1305.6	51.717	1.342	18.64
BRITISH COLUMBIA	19.0	37352.3	2489.7	56.5	131.022	3.506	44.03
YUKON	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NORTHWEST TERRITORIES	0.0	0.0	0.0	0.0	0.000	0.000	0.00
CANADA	535.8	38484.3	34826.6	1473.9	65.000	1.689	23.63

TABLE 3.8

ELECTRIC UTILITIES
PROVINCIAL CONSUMPTION AND COST
URANIUM
1987

PROVINCE OR TERRITORY	QUANTITY KILOGRAMS	HEAT CONTENT KJ/GRAM	COST '000 $	GENERATION GWH	COST $/KG	COST $/GJ	COST MILLS/KWH
NEWFOUNDLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
PRINCE EDWARD ISLAND	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NOVA SCOTIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NEW BRUNSWICK	99250.0	576200.0	16722.2	5106.6	168.486	0.292	3.27
QUÉBEC	87052.0	670000.0	12390.1	4659.9	142.330	0.212	2.66
ONTARIO	1113522.0	639880.5	333203.1	63116.0	299.234	0.468	5.28
MANITOBA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
SASKATCHEWAN	0.0	0.0	0.0	0.0	0.000	0.000	0.00
ALBERTA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
BRITISH COLUMBIA	0.0	0.0	0.0	0.0	0.000	0.000	0.00
YUKON	0.0	0.0	0.0	0.0	0.000	0.000	0.00
NORTHWEST TERRITORIES	0.0	0.0	0.0	0.0	0.000	0.000	0.00
CANADA	1299824.0	637035.2	362315.5	72882.5	278.742	0.438	4.97